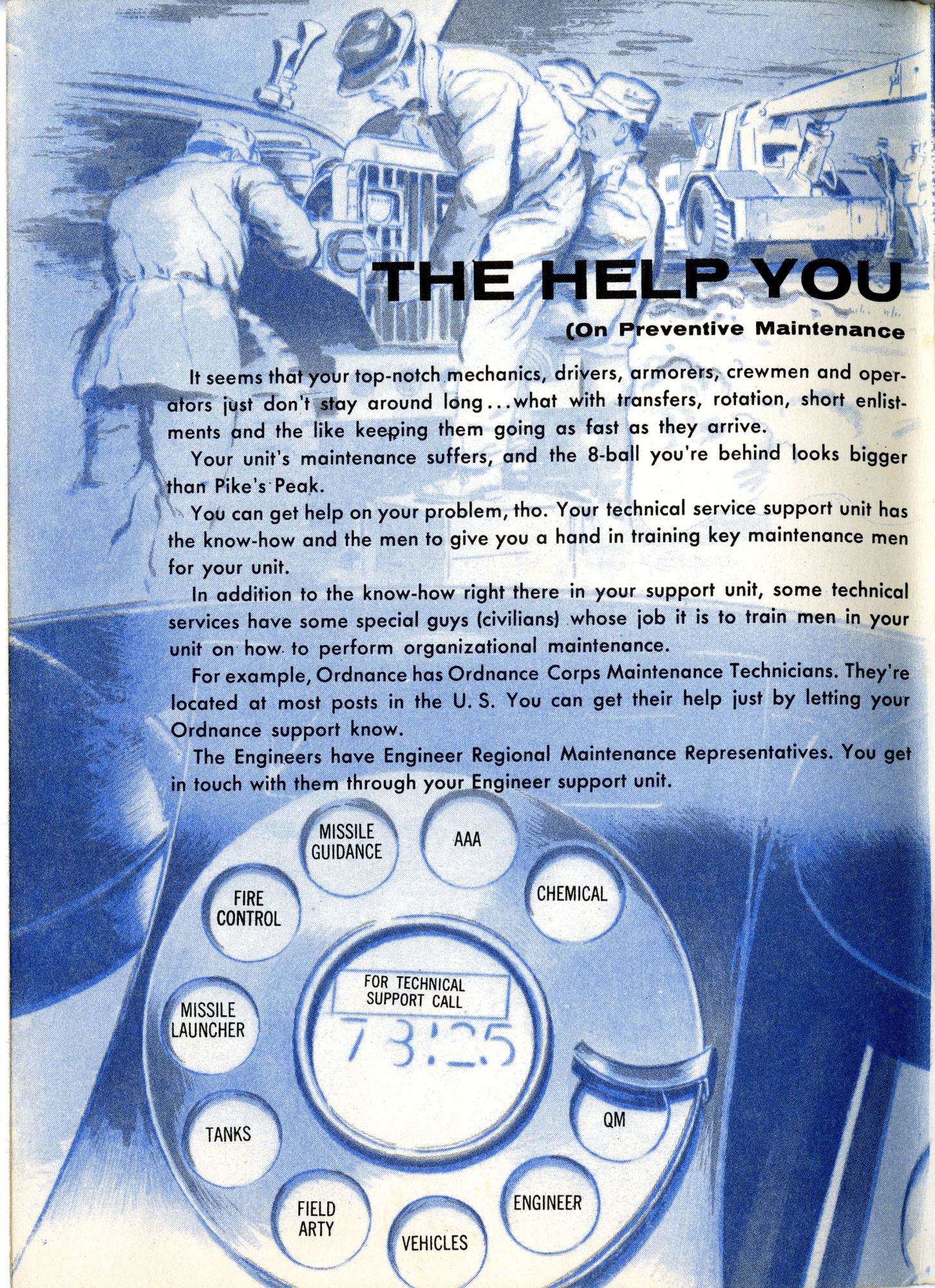
1957 Series
P.S.
Issue 62
THE
PREVENT
MAINTENAN
MONT
HEY...WAIT'LL YOU GUYS SEE THE NEW SUPPLY FORM!
Will Eisner
SPECIAL ARTICLE
New Issue and Turn-in Slip
(See Page 2)



THE HELP YOU

(On Preventive Maintenance

It seems that your top-notch mechanics, drivers, armorers, crewmen and operators just don't stay around long...what with transfers, rotation, short enlistments and the like keeping them going as fast as they arrive.

Your unit's maintenance suffers, and the 8-ball you're behind looks bigger than Pike's Peak.

You can get help on your problem, tho. Your technical service support unit has the know-how and the men to give you a hand in training key maintenance men for your unit.

In addition to the know-how right there in your support unit, some technical services have some special guys (civilians) whose job it is to train men in your unit on how to perform organizational maintenance.

For example, Ordnance has Ordnance Corps Maintenance Technicians. They're located at most posts in the U. S. You can get their help just by letting your Ordnance support know.

The Engineers have Engineer Regional Maintenance Representatives. You get in touch with them through your Engineer support unit.

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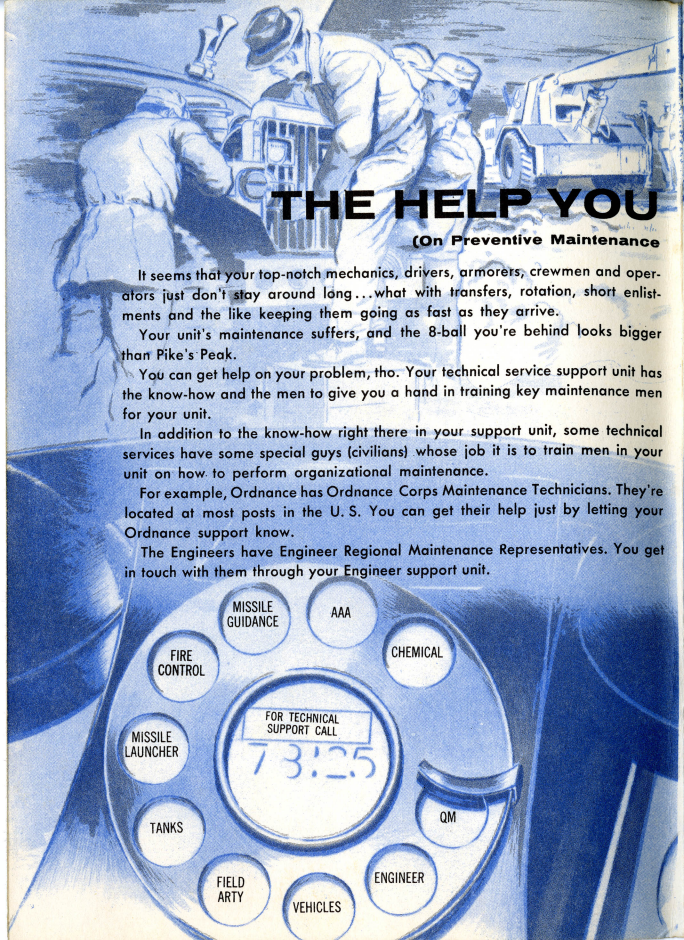

The Chemical Corps has Chemical Regional Maintenance Representatives. See your Chemical support unit.

Quartermaster has Quartermaster Regional Maintenance Representatives. Check in with your local QM unit to get help.

For more details on this technical service help, you might want to look at some official dope: AR 750-912 for Ordnance; AR 750-512, Engineers; AR 750-312, Chemical; and AR 750-412, Quartermaster.

There they are...if you need help, pick up your telephone. Let your technical support know.

PS THE PREVENTIVE MAINTENANCE MONTHLY

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PS wants your ideas and contributions, and is glad to answer your questions. Just write to: **Sgt Half-Mast, PS, Raritan Arsenal, Metuchen, New Jersey.** Names and addresses are kept in confidence.

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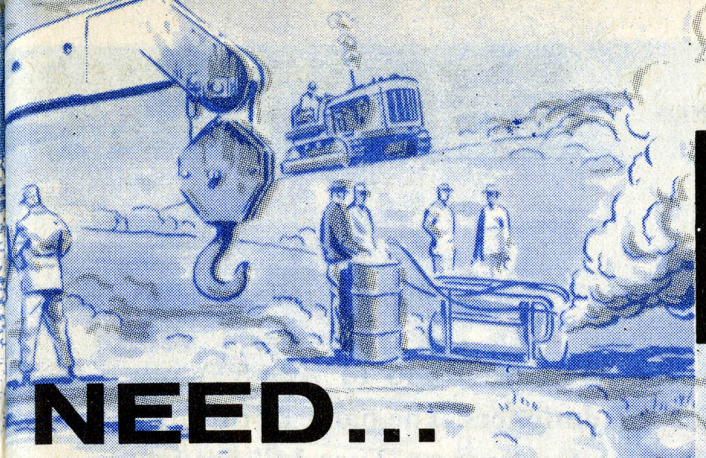

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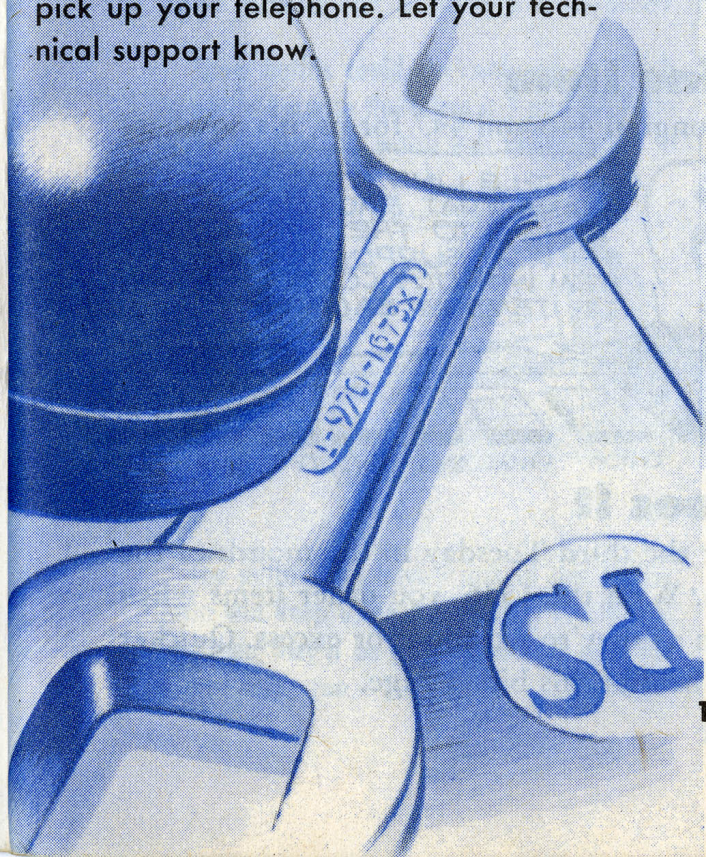

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COLOR comes to the supply room with the double-duty 1546--- combination issue or turn-in slip

Among the smart fashions to come out this season is a snappy 7-part number with colored hemlines . . . er . . . borders.

Well, anyway . . . we're talking about the DA Form 1546 (1 Apr 57) just released by Department of the Army blank form designers. The name of this new bombshell in blank form styling is . . . "Request for Issue or Turn-In" (as you know, all original creations by the DA fashion house have their own names). The name means just what it says: You can now ask for issues or turn-ins on the same form

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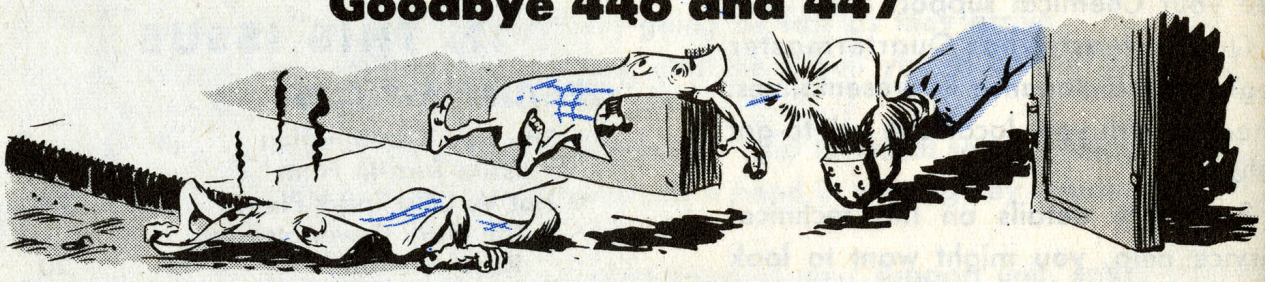
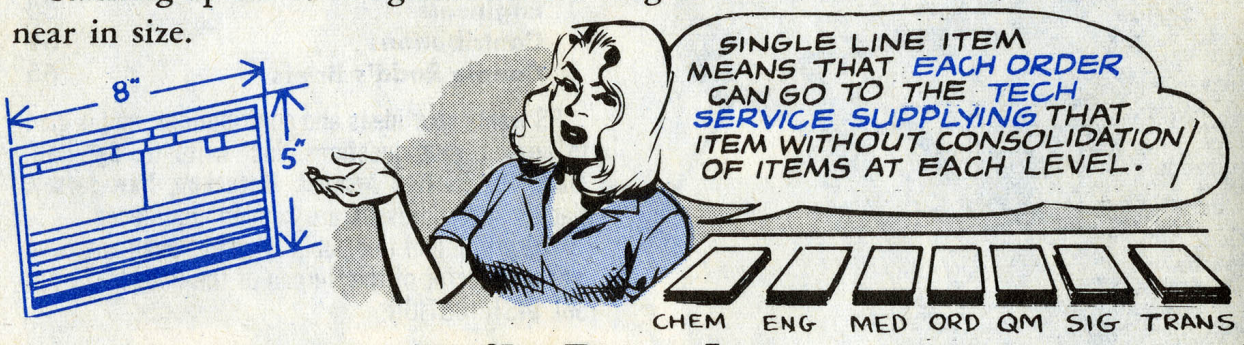


What about DA Forms 446 and 447—the old issue and turn-in slips—you ask. The answer is just what you've already guessed . . . they're gone. After all, nobody wants to be caught using last year's styles—even if they're only blank forms.

Not only does the 1546 look different from anything that's ever come down the pike before—it's also used in new ways . . .

Single Line Item

Stacking up the 1546 against the old longtail 446 and 447 forms, it's nowhere near in size.



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It's finally come! No more waiting for the third Tuesday in the month of the blue moon to put in a request or turn-in. With the 1546, you order items when you need them—and turn them in as soon as they're worn out or excess. Quicker service with less work is the whole idea behind this big change.

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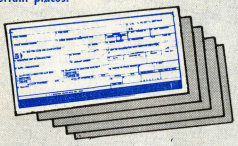
Department of the Army set the whole works off with a TWX that said everybody should start getting friendly with 1546 as of 1 July 1957. Making yourself acquainted with this new form, of course, means understanding what gives with all this color business and who puts what in which blocks.

JUST A MINUTE!

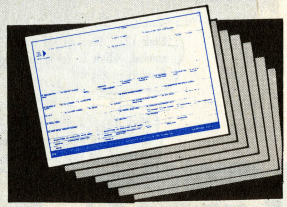
Before running off at the mouth about our latest style issue and turn-in form, let's pause for a minute and clear the air.

Some outfits could get confused on which is which, because there was a 5-part DA Form 1546 (1 Aug 55) which was being tested in certain places.



The outfits that have issues of this earlier form will keep using it until they're all used up—then they'll be playing around with the 7-part form, too.

There are more parts to the newer form.



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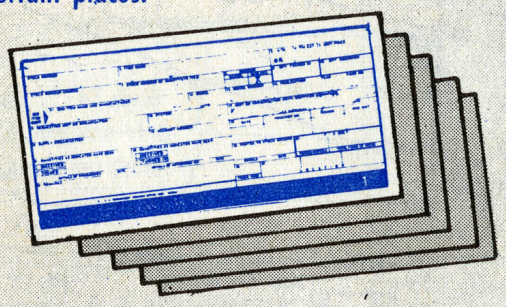

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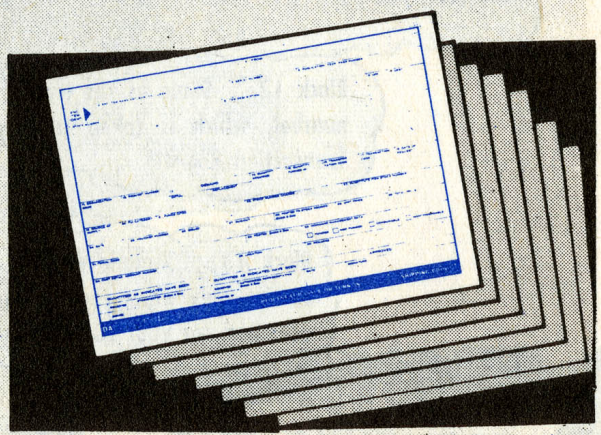

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By The Colors . . .

This 7-part form has carbon-backed pages that snap out from a binder on the left hand side. The carbon is so when you write on Copy No. 1, all the writing goes thru to the last copy.

Almost every one of the copies is a different color . . . for a reason. Just to make sure everything moves faster, the colors were added. Why? Because they can tell the man who understands them a quick story on the item he's interested in—besides being another way of pointing out which copy goes where. Actually, knowing the color code cuts down the chances of organized confusion setting in. Just watch.

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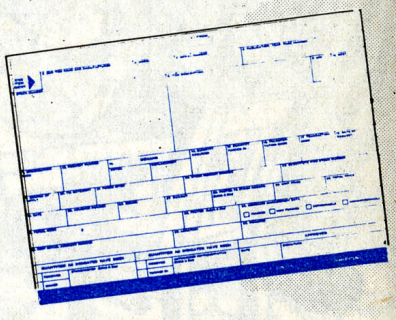


To Each Its Own

Block 1 . . . Unit address (address it to yourself)

Block 2 . . . The tech service supply point

Block 3 . . . Block 4 . . . Block 5 . . . Identifies major end item (vehicle, gun, etc.)

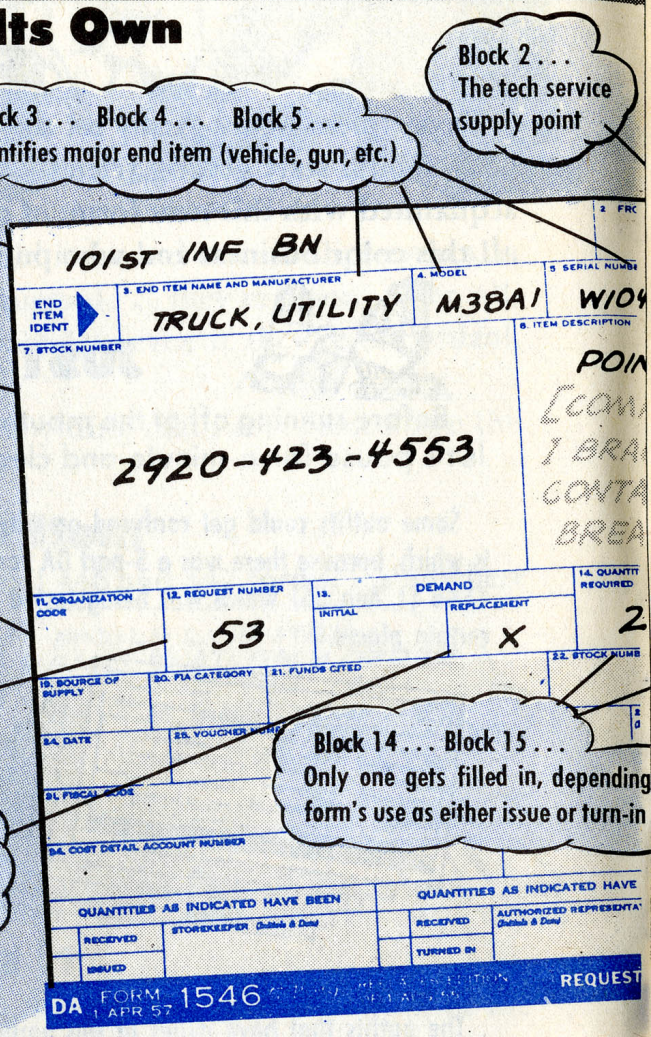
Block 7 . . . Federal stock number has first choice, when available

Block 11 . . . Using unit fills in only when issue or turn-in request is sent by radio or wire

Block 12 . . . Same as the transaction number, which is taken from your Transaction Register

Block 13 . . . X-mark goes in INITIAL portion only when your unit becomes activated—or your TOE allowances increase

Block 14 . . . Block 15 . . . Only one gets filled in, depending form's use as either issue or turn-in



All blocks after Block 18 are filled in by the technical service supplying the item, except for Block 36 and the bottom line, where the property book officer or his authorized representative writes the date of approval and his name.

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#3 . . . DUE-OUT COPY (RED)

This copy comes back whenever any due-out action—full or partial—is started or continued.

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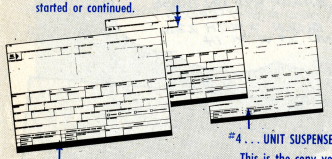
This copy is held by the technical service supply outfit for its records.



#5 & #6 . . . UTILITY COPIES (BLACK)

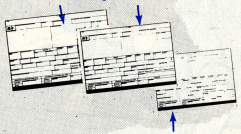
Both are used by the tech service for accounting work.

#4 . . . UNIT SUSPENSE COPY (BROWN)

This is the copy you keep for your suspense file. It gets torn up when you get your supplies or tech service sends you a red due-out copy (No. 3) for your suspense file.

#7 . . . DEMAND DATA COPY (BLACK)

This is the cardboard back of the form. It also stays with the tech service supply people for keeping track of supply demands.



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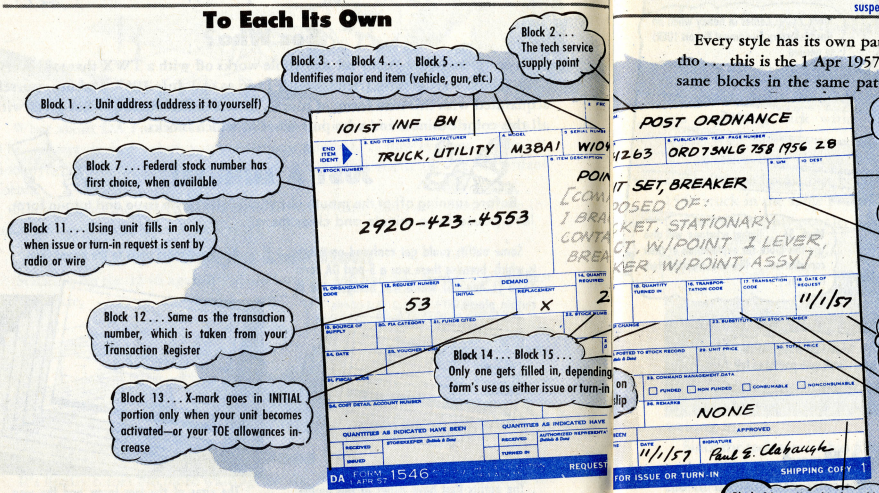

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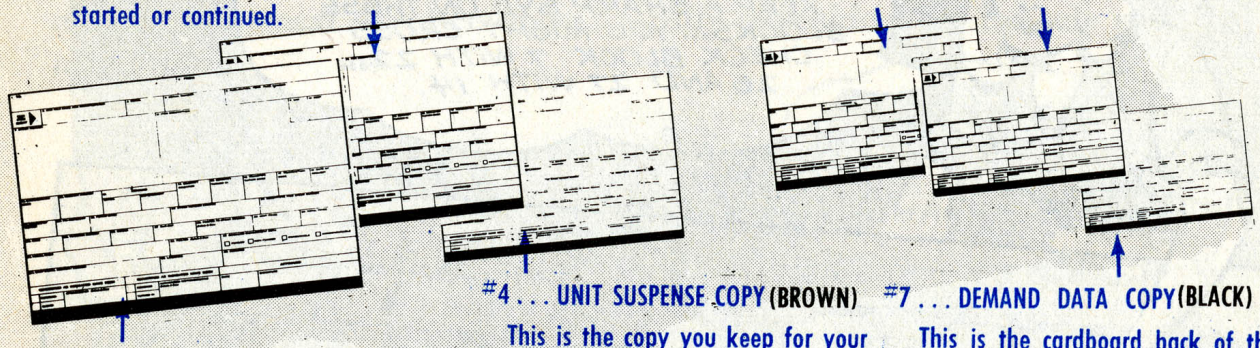

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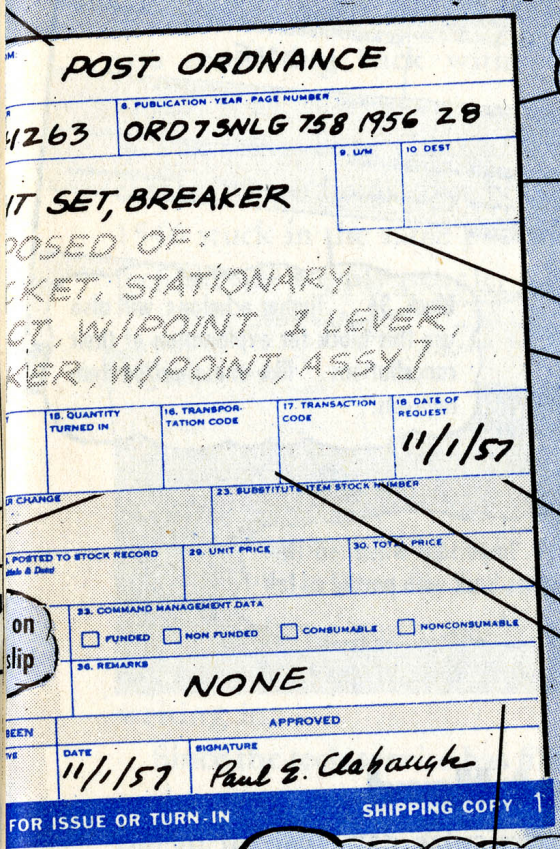

Block 6 . . . Authority (catalog, manual, TOE, TA, etc.)

Block 10 . . . Higher echelon owns this block

Block 9 . . . Unit of measure is what it means (ea, set, can, roll, etc.)

Block 8 . . . The name of the item's enough! (Skip everything else shown in brackets here.)

Block 18 . . . Date request is made out. Not always the same as bottom line . . . that's the date approved and sent off

Block 16 . . . Block 17 . . . Higher echelon owns these two

Block 36 . . . Use this for added info. Examples: **DEADLINE** or **EMERGENCY** when used as issue . . . or **FWT, R/S, S/S — UNSERV** or **SERV** when used as turn-in . . . or write **NONE.**

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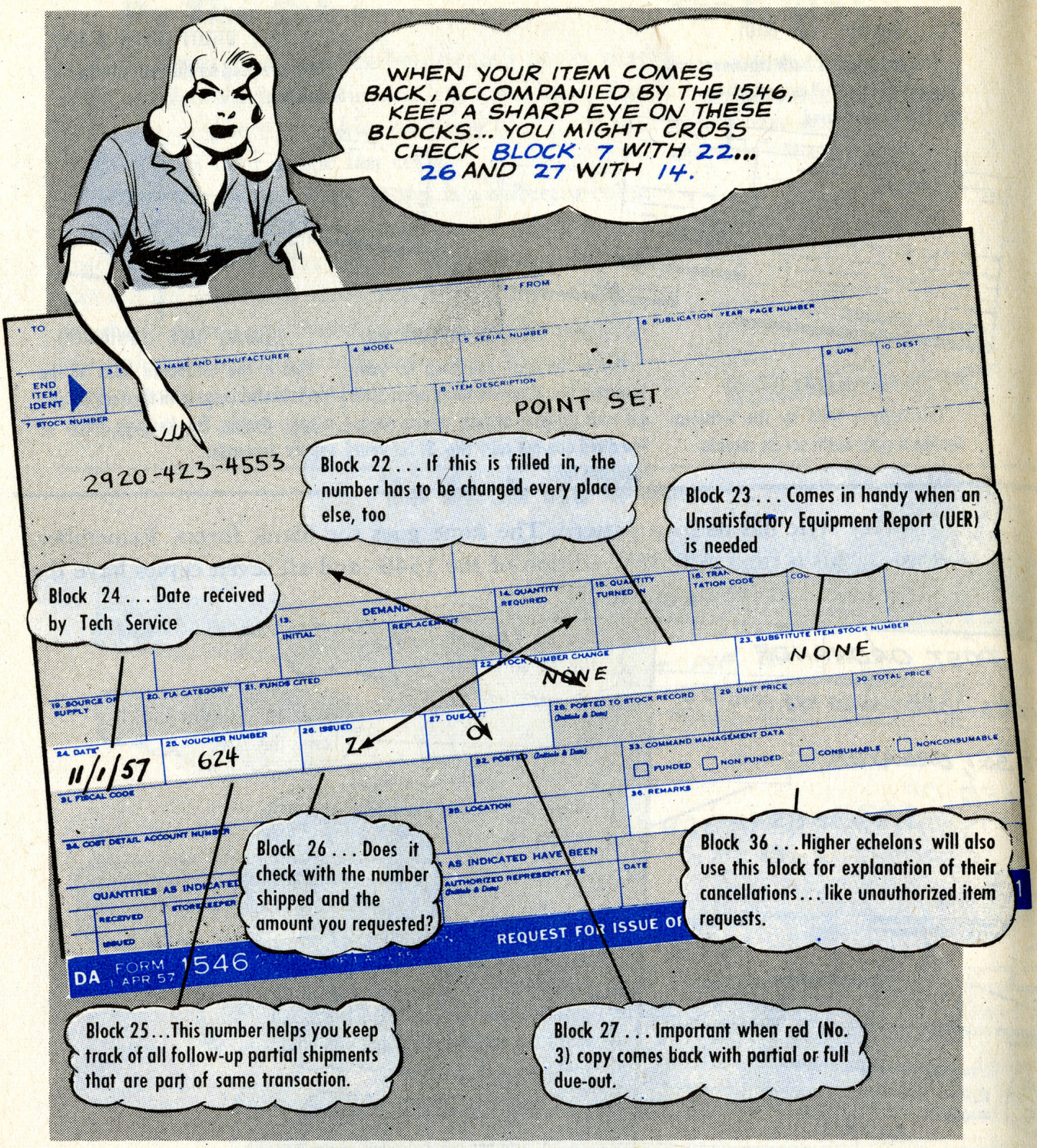
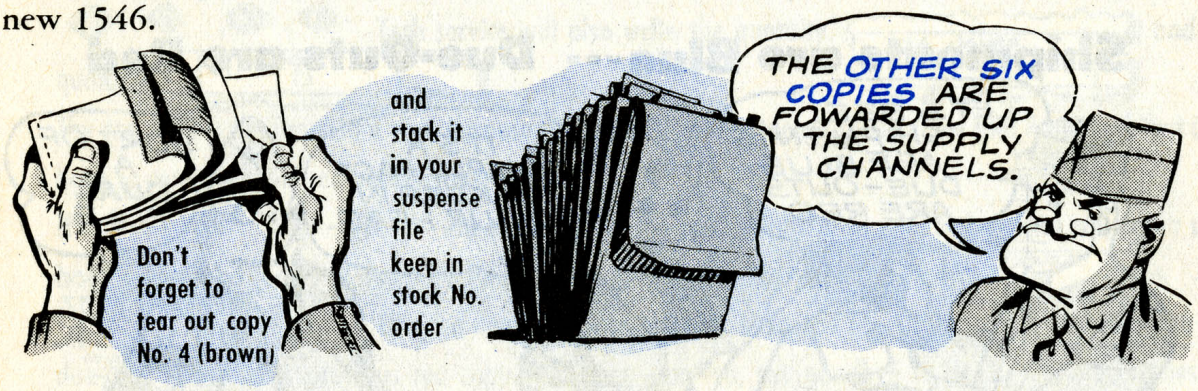


Using the 1546's Not Hard

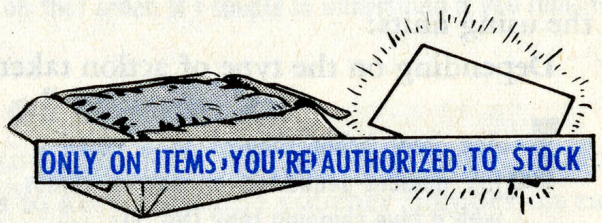
Once you decide what items you need for any particular day, just fill in the blocks you are supposed to put writing in and give all the 1546's for that day to your Unit Supply Officer, so he can approve each request. As far as how many of an item to order, keeping track of the previous day's requests can be a handy guide.

For instance, if you received 10 requests for an item yesterday, then ordering 10 more this morning will keep your stock at the proper level. If this item happens to be off your shelf when somebody asks for it, then you sure want to get an order started off the next day. Remember . . . daily requisitions are the rule with the new 1546.



Pre-prints Make It Easier

The tech service supply people are being extra good these days by giving you something back with your shipment.



The action copy (blue or red) of the 1546 you made out will be returned on each of these items. But besides this first action copy, there's a complete new 1546 stuck in the same package . . . part of it is already filled in for you by the tech service supply people.

What this actually means to you is that this pre-printed form is the **authority** for the next order you make out on the same item. This is tech service supply's way of helping you to make sure that the next time this item is ordered it has the right info on it. All you do is fill in the rest of the blocks you have to put writing in.

Since the tech service has filled in Blocks 7, 8 and 9, there's no need to go back to the supply catalog or manual every time you want to re-order . . . because the correct dope is already on the form. As far as the rest of the blocks go, the tech service supply people are mostly helping themselves out by pre-printing in any other blocks. Even so, the info in those blocks can come in handy when you make out a statement of charges or report of survey.

With the pre-printed information on it, a 1546 made out for replacement items can go off with Block 6 left blank. It's only on the requests that aren't pre-printed that you have to give the name, date and page number of the catalog, manual, TOE, TA or other authority that lists the item (an Ord 7, for example).

Shipments are Blue--- Due-Outs are Red

Tech service supply follows two simple rules in returning copies of the 1546 to the using units:

Depending on the type of action taken, it looks like this to you:

1. Any item being shipped to a unit—full amount requested or partial—comes with a blue shipping copy (No. 1)

A completely filled order has the blue copy only

2. All due-out actions—full or partial—come in on a red due-out copy (3)

A full due-out has the red copy only

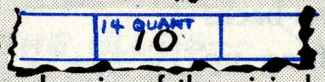
When the first shipment arrives, the blue copy of your 1546 will have the numbers in Blocks 26 and 27 lined out—and replaced by the number shipped and the number still due-out.

With partial shipments, the blue comes back to cover quantity shipped and the red tags along to cover the portion still due-out.

If more than one partial shipment is needed to finish off a single transaction, then the tech service makes out new 1546's each time. . . because the blue copy on the original 1546 made out by you has already been used up.

When it takes a couple of partials to make up a single transaction, new blue and red copies come along, too, so you will have an up-to-date report on how many were shipped and how many are still due-out.

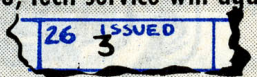
Here's the Way it Might Work

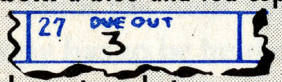
Say the quantity you requested is 

but only 4 of that item are available for shipment. Then the blue **and** the red copies of the original 1546 are sent back with the shipment of Tech service will also write the quantity

and the quantity

The red copy is the important one, because it goes into your suspense file to show that 6 more of that item have to come yet (the red border says "due-out").

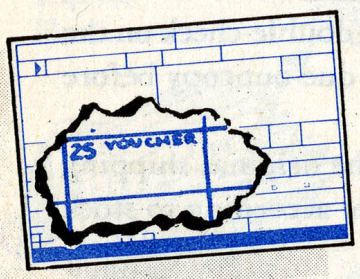
If only are available for the next shipment to you, tech service will again send **both** a blue and red copy down by filling out a new 1546 which will say 

and 

This red copy **also** goes in your suspense file, because 3 of that item are still due-out . . . but your previous red copy is useless now—so, say goodbye to it. File the blue copies for property book items **only**.

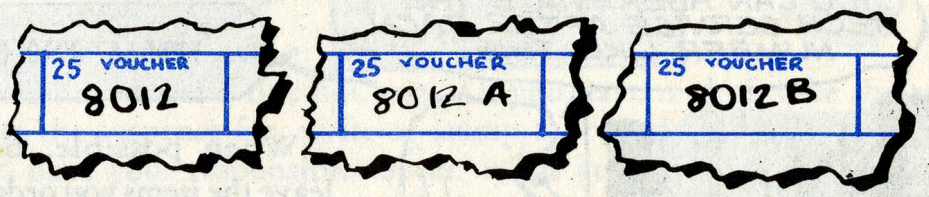
When tech service supply makes the final shipment of the item due-out, **only** the blue shipping copy will be sent along—because no due-out action's left on that order. It's simple to understand if you remember the **dual rule.**

The Story of Block 25



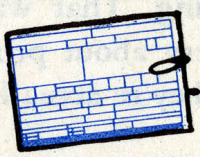
Whenever partial shipments and due-outs crop up, tech service supply has to keep the same voucher number on each of the blue and red copies needed to fill the original request. So, the original 1546 will have a plain voucher number . . . like 8012, for instance. The following 1546's blue and red copies that tech service sends down will be tied into the voucher number assigned to the original request by adding a letter after the number.

They come out looking like this . . .



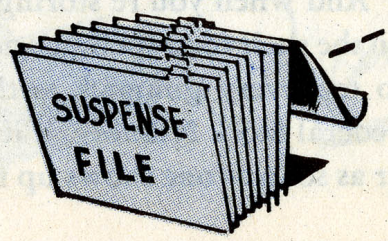
once the transaction is finished off . . .

Clip all the blues together (same voucher numbers)



and file 'em

Also . . . from the

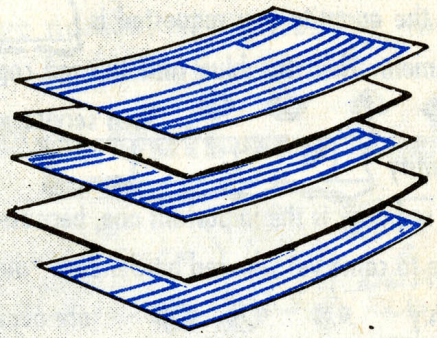


The red bites the dust

and be careful to keep those pre-prints where you can get 'em real quick.

Watch the Carbon

A good way to keep the carbon backs on each loose copy from rubbing up against the front of the next 1546 copy is to stick a piece of paper or thin cardboard between.

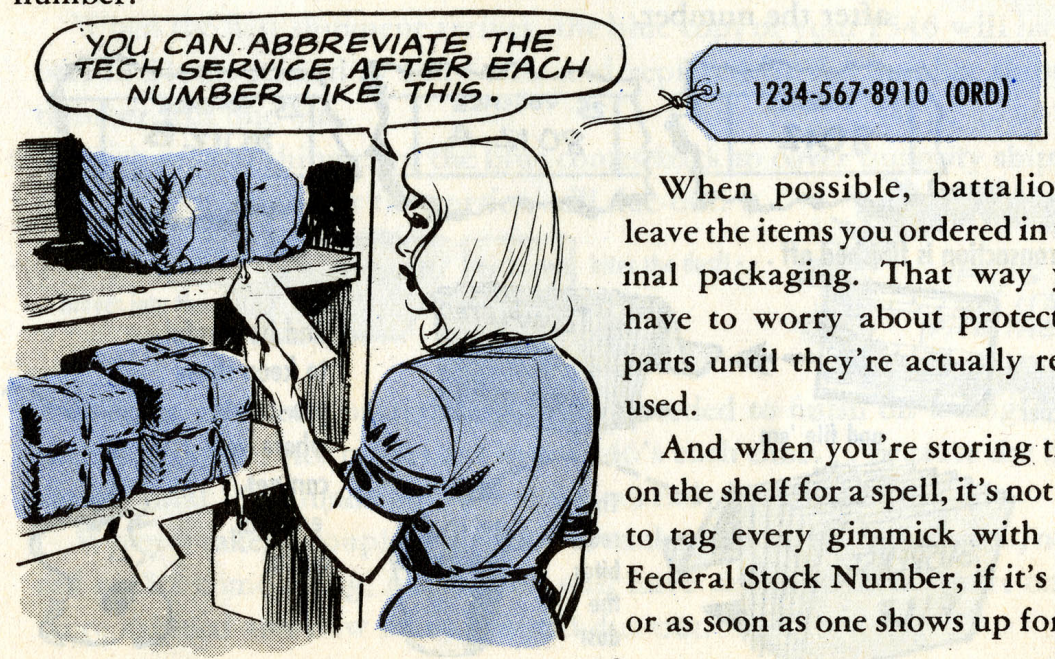


Checking Up

When a shipment comes in from tech service, you check the quantity shipped against the quantity shown on the blue shipping copy (No. 1). Also check up on:

Of course, the brown-bordered copy (No. 4) can be used to double-check on the original order by comparing it with the returned shipping or due-out copy before you dump the brown one in the junk file.

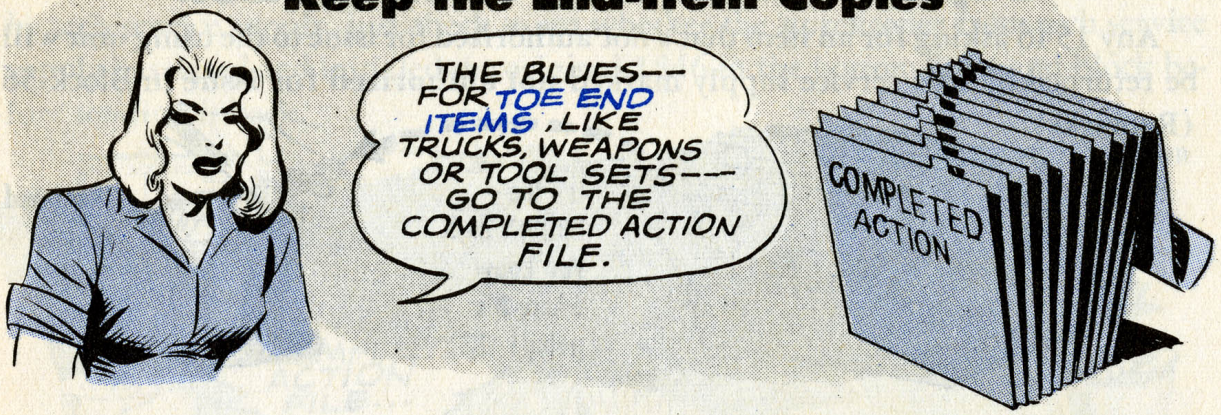
Be careful not to lose the pre-print that comes back with the original shipping copy. The safest way is to stick it right into your suspense file according to stock number.



When possible, battalion should leave the items you ordered in their original packaging. That way you don't have to worry about protecting those parts until they're actually ready to be used.

And when you're storing these items on the shelf for a spell, it's not a bad idea to tag every gimmick with the item's Federal Stock Number, if it's got one... or as soon as one shows up for it.

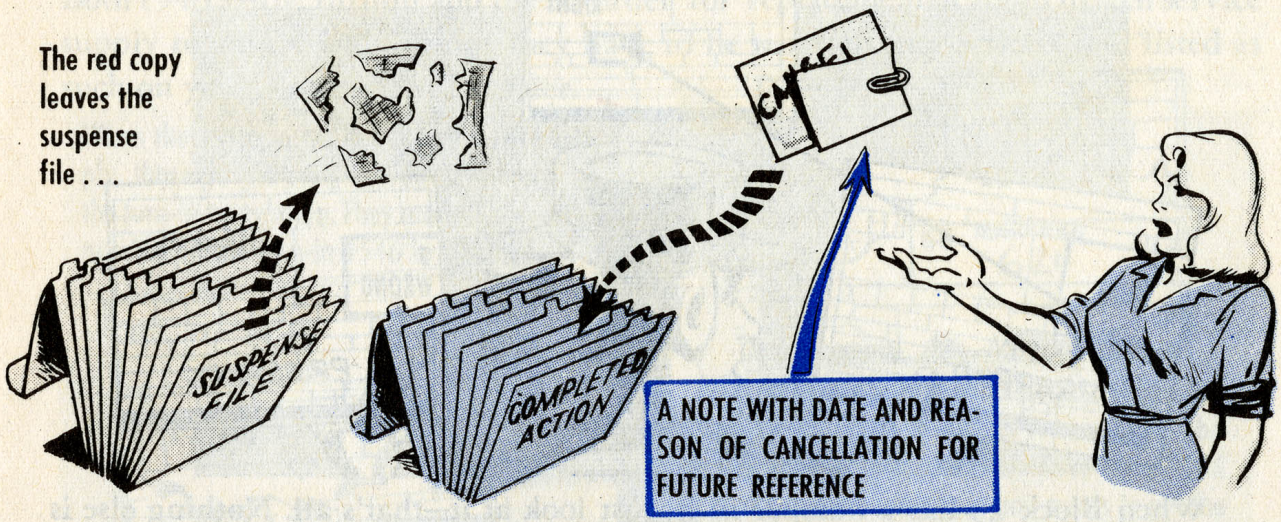
Keep the End-Item Copies



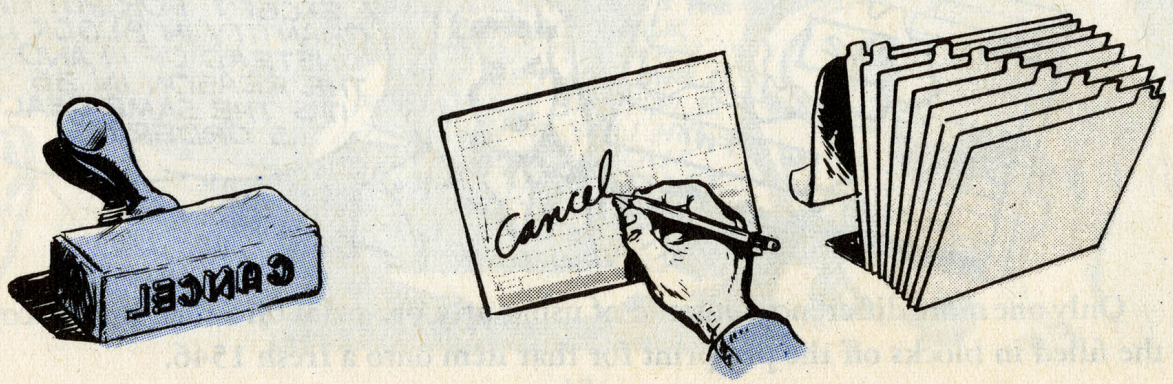
Since the item has to be accounted for in the TOE Property Book, the shipping copy has to be held onto in order to back up each entry in that book. There should be a separate section in your files for items not stocked, but ordered "as required."

Due-Outs Can Be Canceled

There's more than one reason tech service supply may cancel a due-out. The most usual is ordering an item that becomes unauthorized. Whatever the reason:

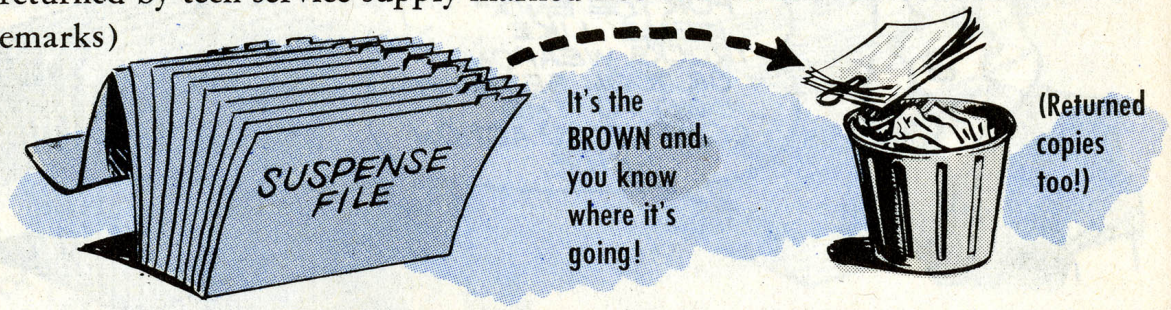


You might decide to cancel a due-out, too. All you have to do is take the red due-out copy from the suspense file, write or stamp the word CANCEL across it slantwise, date it, have your responsible officer or his authorized representative sign it again, and send it to tech service supply for action.



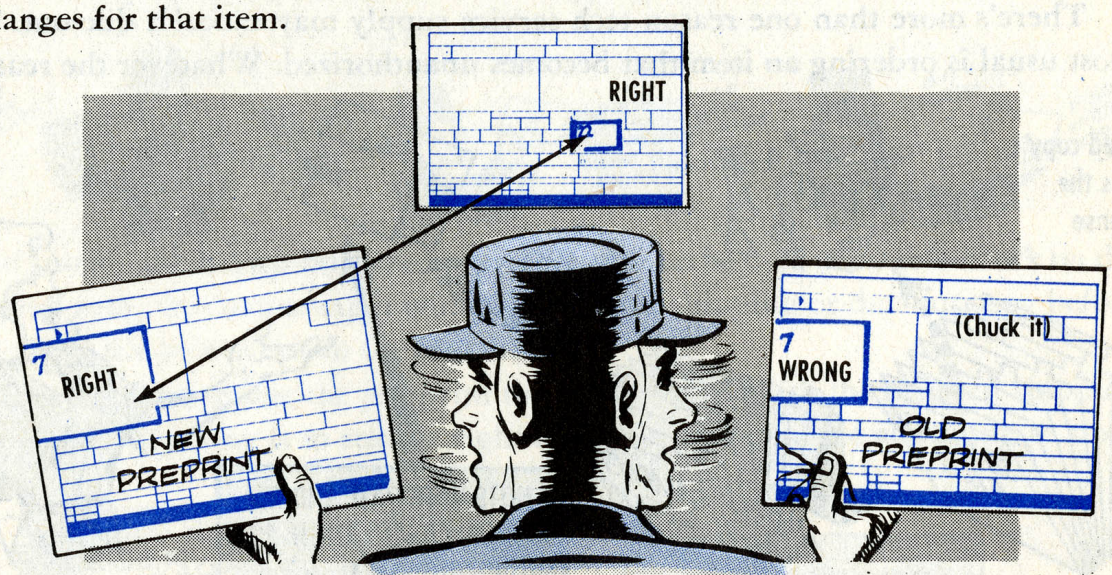
Suppose the Item's Unauthorized

Any 1546 asking for an item that's not authorized for issue to the using unit will be returned by tech service supply marked **not authorized for issue** in Block 36 (Remarks)



When to Chuck Pre-prints

Holding on to pre-prints with old stock numbers is dangerous. It may take months before tech service supply ever finds out what you were after. So, every time a copy of your 1546 comes back, check Block 22 carefully for stock number changes for that item.

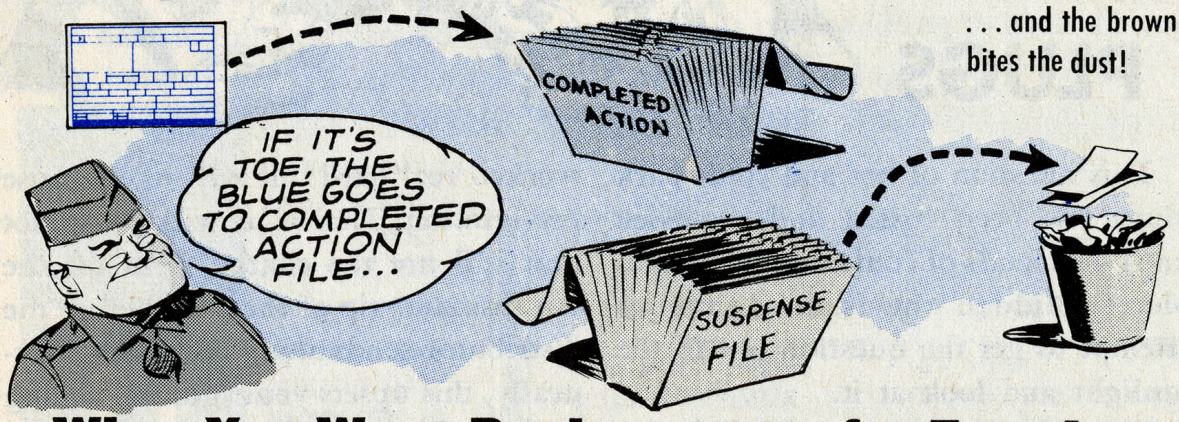


When Block 23 has a number in it, just look at it—that's all. Nothing else is necessary for a SUBSTITUTE item.

A Turn-In's Just As Simple

Only one more difference—instead of using up a pre-print on a turn-in, just copy the filled in blocks off the pre-print for that item onto a fresh 1546.

Since nothing comes back with the shipping copy when it's returned as a receipt by tech service supply, just check to see whether the storekeeper from tech service supply has dated and initialed the original 1546 in the bottom left-hand block before sending it back.

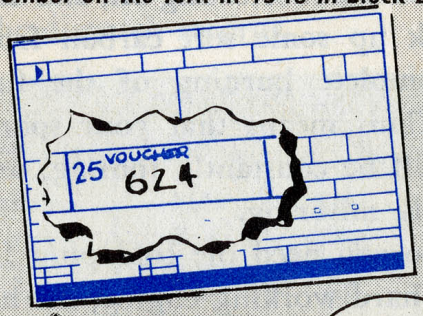


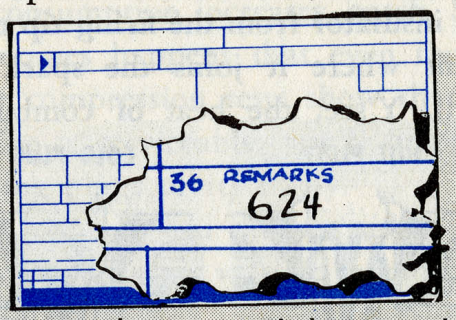
When You Want Replacements for Turn-Ins

(Other than Direct Exchange)

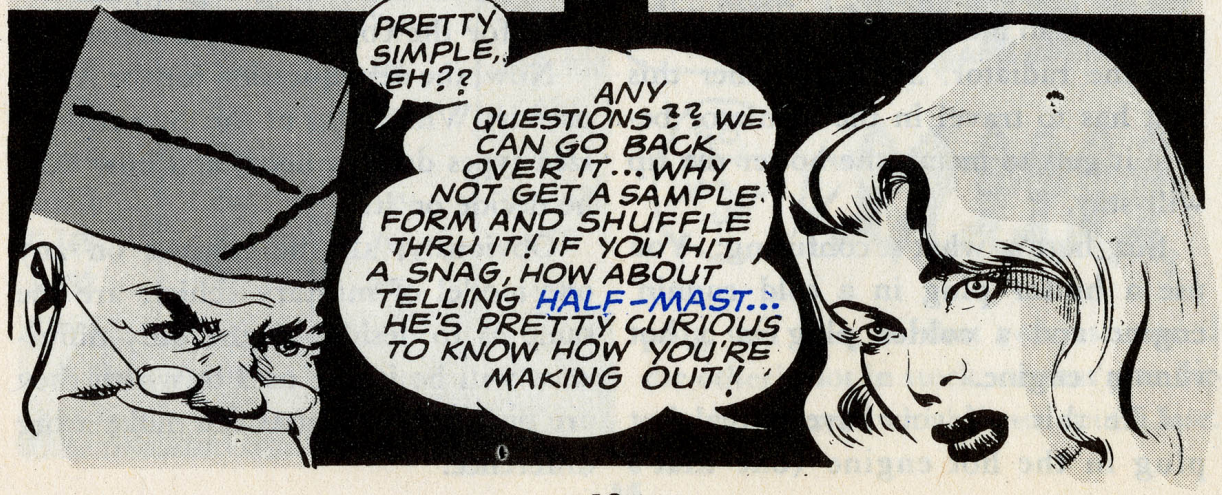
When the FWT turn-in needs a fast replacement, a second 1546 does the trick. Both 1546's—the turn-in and the re-order for replacement—can go to tech service supply together. Only thing—they have to be separate transactions, and listed as such on your Transaction Register.

When these two forms get to tech service supply, those people assign a voucher number to the turn-in transaction. They mark this voucher number on the turn-in 1546 in Block 25.

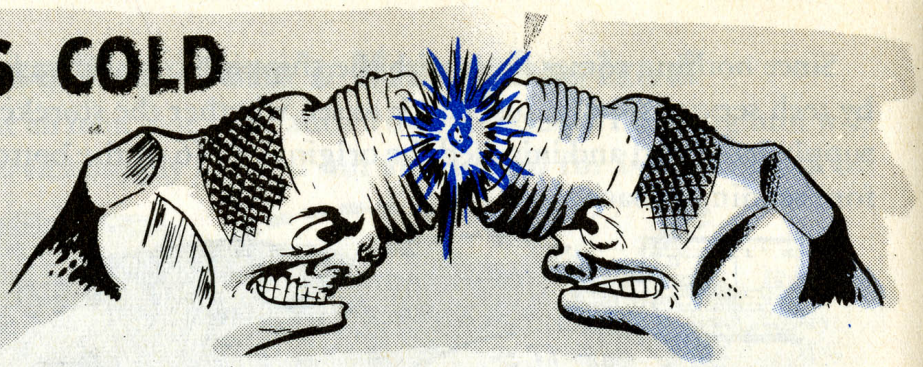




The same number goes into Block 36 (Remarks) of the 1546 asking for the replacement. This note in the Remarks block of the re-order 1546 is all the **authority** your unit needs to get the replacement.



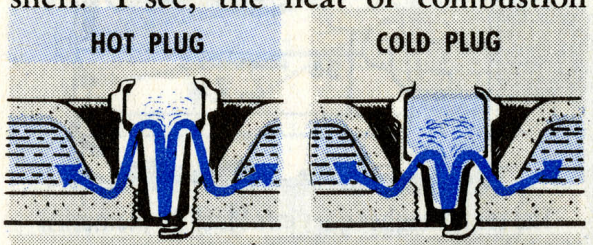
HOT VS COLD SPARK PLUGS



This question of hot and cold spark plugs has been cussed and discussed until the clouds of confusion have completely hidden the issue. Leave us attempt to get the question out in the sunlight and look at it.

The first step, mebby, is to decide what a "hot" plug and a "cold" plug are.

The heat range of a spark plug is determined largely by the length of the insulator from the firing tip to the point where it joins the spark-plug shell. Y'see, the heat of combustion passes up the insulator to the steel shell, then through the shell to the cylinder head, and so finally to the water jacket and the radiator. So, the farther this heat has to travel in the insulator before it gets to metal, the hotter the tip will stay.



But here's what's confusing: You use a **hotter** plug in a cold runnin' engine and a **colder** plug in a hot runnin' engine.

Like this — if you have a real hot plug in the hot engine (one that's worked real hard), it will likely cause pre-ignition. That is, it will get so hot that it'll fire the charge right off the hot insulator tip of the plug before the distributor sends along the spark. Naturally, this upsets your ignition timing and causes detonation, loss of power, and destructive hammering on the pistons, wrist-pins and connecting rod bearings. (O'course, wrong timing, bum fuel, sticky valves or lack of water can make even a cold plug pre-ignite.)

On the other hand, if you have a cold plug in a cold engine (one that idles a lot), it'll not get hot enough to burn off the lubricating oil, and also will pick up some soft carbon from the incomplete burning of the fuel charge. This means that your spark-plugs will be constantly fouling, and eventually misfiring.

OK, so you need the cold plug for the hot, hard working engine, the hot plug for the cold engine, understood?

Now, the next question for the Army user is: What plug of the two authorized types does he need, and how does he decide on it?

Obviously, all the engines on any one model of military vehicle are the same as to design, so the only difference will be in the uses to which they are put. But these uses can make a big difference.

F'rinstance, the deuce and a half that is running 30 odd miles each way on the highway, at highway speeds 45 to 55-MPH, supportin' a satellited unit is gonna be a lot hotter running truck than one that putters around from the mess hall to the Quartermaster issue point and back under a 20-MPH post speed limit. And the Jeeps that are used for hauling only are gonna run hotter than the CO's Jeep that stands with its engine idling to keep the command radio going.

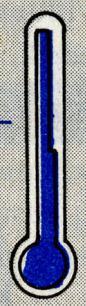
PLUG USAGE GUIDE

FSN 2920-752-4258

COLD PLUG – LOW INSULATOR SEAT QUICKLY CARRIES HEAT FROM CORE

FSN 2920-835-7724

HOT PLUG – HIGH INSULATOR SEAT ALLOWS CORE TO KEEP MAXIMUM AMOUNT OF HEAT



HOT TYPE ENGINE	SEVERE SERVICE
HIGH SPEED	HIGH COMPRESSION
HEAVY LOAD, 4 HAUL	MINIMUM STARTS & STOPS
LONG UP GRADE	HOT CLIMATE
COLD TYPE ENGINE	LOW SPEED
LOW COMPRESSION	FREQUENT STARTS & STOPS
GOVERNED SPEEDS	COLD CLIMATES

So, if you know what use a vehicle is going to be put to most of the time, you've got a good start on deciding which spark plugs it needs. Also, if you get a vehicle that comes into the shop with badly fouled plugs, best you ask about the job it is on, or go check the dispatch records.

PLUGS AND WHICH VEHICLES USE 'EM

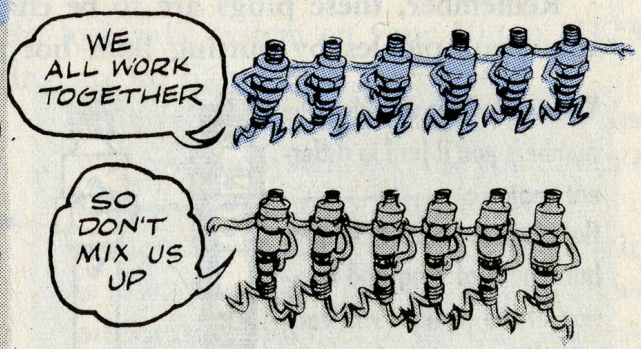
Vehicle Series	Hot Plug	Cold Plug	Point Gap
G-758	Yes	No	.030
G-740	Yes	Yes	.030
G-741	Yes	Yes	.028-.030
G-742	Yes	Yes	.030
G-744	Yes	Yes	.030
G-280	Yes	Yes	.028-.032
G-749	Yes	Yes	.030
G-792	Yes	Yes	.030

Hot Plug, FSN 2920-835-7724
Cold Plug, FSN 2920-752-4258
ALWAYS SET THE GAP ON NEW PLUGS

But there's another thing that enters the picture. As an engine wears out, its oil consumption increases, natch. So it sometimes happens that even though your compression tests show that the engine is serviceable, you'll find it is fouling plugs pretty badly.

So you see, you can use either plug in any wheeled vehicle **except** the M38A1.

But, the word "Optional" in the SNL's does **not** mean you can use either



plug you like, or that you use one if the other's not in stock, or that you flip a coin to see which one you'll use.

You've gotta select your plugs to match the job your vehicle will be doing.

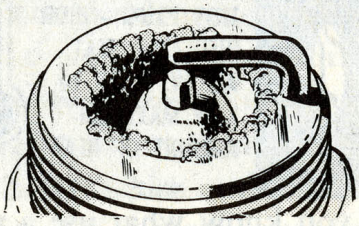
Be darn sure, when you order the hot or the cold plug, that your supply man gives you the kind you want.

Now, about going from the hotter plug to the colder. Sometimes this may be necessary. Like if a truck is transferred from slow on-post duty to over-the-road. You decide it like this—if the truck's timing is right on the mark and you get any detonation when pulling hard with a normally hot engine, the chances are you should move it over to the colder plug, FSN 2920-752-4258.

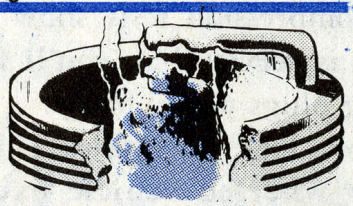
Now if you have the truck at hand but can't find out what use it's getting, the plugs themselves can tell you what's needed.

THEY SPEAK FOR THEMSELVES

Wet, sludgy deposits indicate oil fouling. Go to the hotter plug unless your engine is to be changed.



Dry, black fluffy deposits indicate gas fouling. Adjust carburetor idle mixture. If you still have gas fouling, change carburetors. (Be sure drivers are not overchoking.)

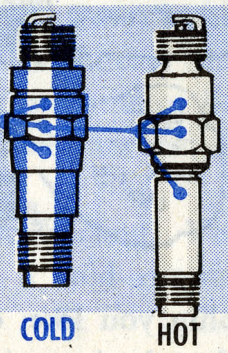


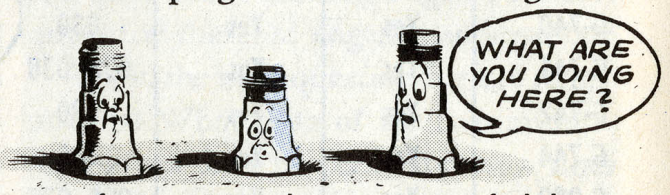
White, burned or blistered insulator nose and badly eroded electrodes mean the plug's too hot. Go to colder plug.

Rusty-brown, grayish tan or white powdery deposits, electrodes only mildly eroded, indicate everything's fine. Carry on with the plugs you have.

Remember, these plugs are to be changed only in sets. That is, you don't mix your pickles by putting both hot and cold plugs into the same engine.

You can tell by checking the numbers you'll find in different spots. Hot plugs usually are longer, but length of plug and location of the number will vary with different manufacturers.



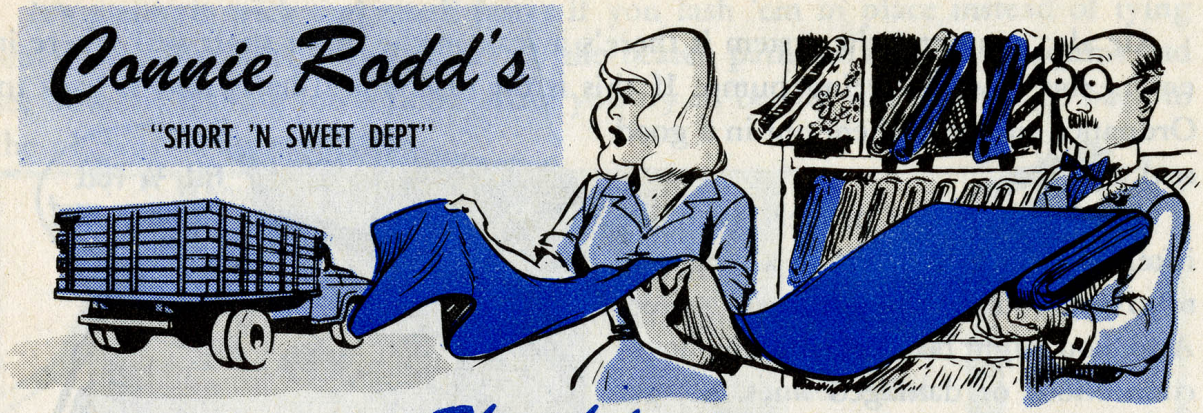


If you are just replacing one or two fouled, burned or defective plugs, be sure they are the same as the rest of the set that's already in the engine.

TM 9-8638 (Dec 1956) is a good book to have—it's full of dope about spark plugs. Get one for your outfit if you don't have one.

Connie Rodd's

"SHORT 'N SWEET DEPT"



The whole story

Have you got your tarps and bows for the Model 424 2½-ton stake and platform trucks yet? If not, there's probably a manufacturer in your area who can supply these local purchase items under the provisions of SR 715-110-50 (2 June 54).

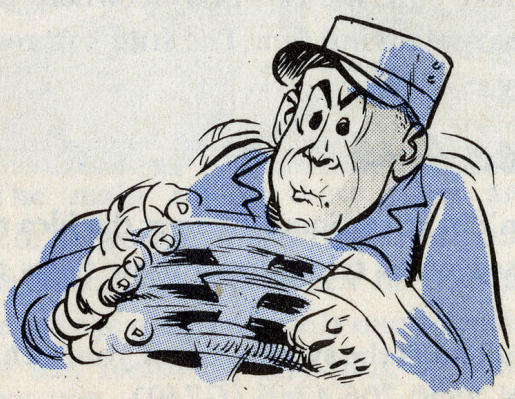
Normally, the manufacturer of the truck doesn't make the tarps and bows to go along with the vehicle. This being the case, tell your Ordnance support outfit you need the items, and they'll take the problem to your local purchasing office or pass it on to the depot supporting them. These people will screen the area and come up with the manufacturer who does make these tarps and bows.

The tarp package kits they'll get you should run anywhere from $125 to $140, depending on how many they have to order.

When ordering, don't forget to tell your Ordnance support what kind of truck you have and its body dimensions. Be a good idea to request the dope on how to put those tarps on, too.

The sneaky vibrator

Been wondrin' what's snuck into the hydraulic system on your 10-ton M123 and M125 trucks to make that steering act up like it does sometimes?

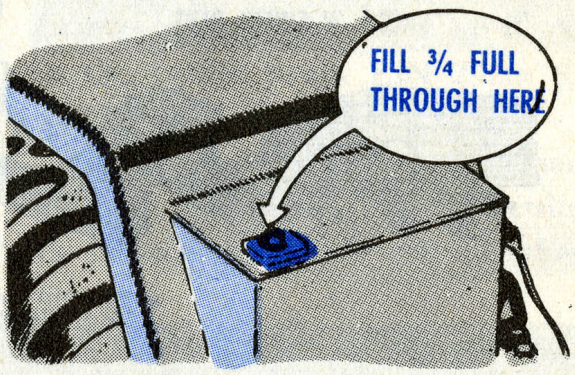


That sneaker may just be makin' its way into the system because you haven't kept its level up to snuff (¾ full).

Here's what happens if the reservoir is low. The pump'll draw air as well as oil, causing bubbles to get into the system. When these same bubbles hit the valve, they cause it to fluctuate, setting vibrations in motion. The flutter this creates can be felt clear up to the wheel.

Air also can enter the system if there's a leak in the input shaft seal where it enters the power steering pump. If this is the case, you'll hafta take it back to Ordnance and have them put in a good seal.

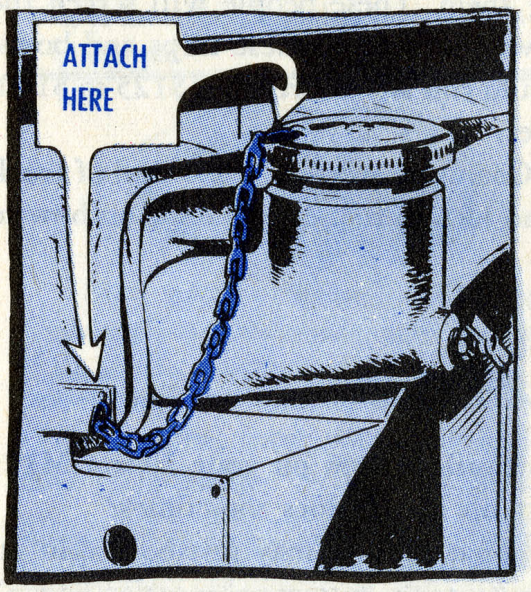
Keeping it to the proper level like it tells you in your LO'll go a long way to giving you the smooth steer desired. Also, you might be losing oil from loose connections or damaged lines. So, get out and get under and see.



Where are you?

When the cap hits the fan it can cause all sorts of pain under that hood. For one, it can knock a hole in your radiator big enough to drive your fist through.

We're talking about that radiator filler cap, of course. Some guys, when they go to fill their radiators with water, have been taking that cap off and putting it on top of the radiator—while the engine's running. One slip and that cap falls into the fan and is off like the 20th Century Limited—right through the radiator.



You've got a couple of ways to stop this. One is to slip that cap in your pocket. Some guys have been attaching a short piece of chain to the top of the cap and have wired the chain to a bolt or brace. That way you can let the cap dangle without chance of it hitting the fan. Good way to keep from losing it, too.

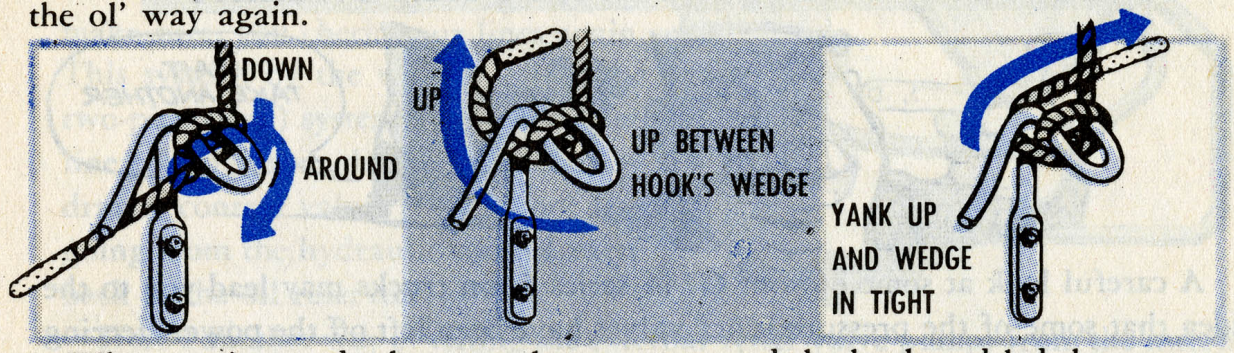
But, whatever way you do it, just make sure the cap gets no where near that revolving fan. The stuff can really fly

Wedge type hook

Don't get tied up in knots when you don't have to. Some men get the idea that unless a dozen or more sailor knots are used when tying down those tarps that the lash ropes won't stay put.

This may be true with some of the tarp hooks in the system, but if your vehicle has the "wedge" (pigtail) type hook FSN 2540-706-4246-(G749), you won't have to do it this way.

It's a simple trick and much faster if you lash 'em in place instead of tying 'em down. Just so you won't stray off the beaten path too far, take a squint and see how the lashing job is done. After you try it, betcha you'll never go back to the ol' way again.

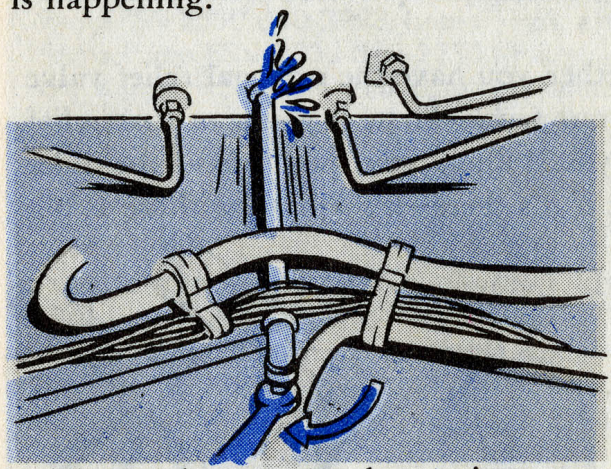


When you've made that complete turn around the hook and led the rope up into the wedge between the base and the pigtail, give the rope a good yank **up** and **in** (to seat it tight in the wedge). This'll hold it good'n solid so it won't slip. Tuck away the extra rope so it won't slap the body of the truck.

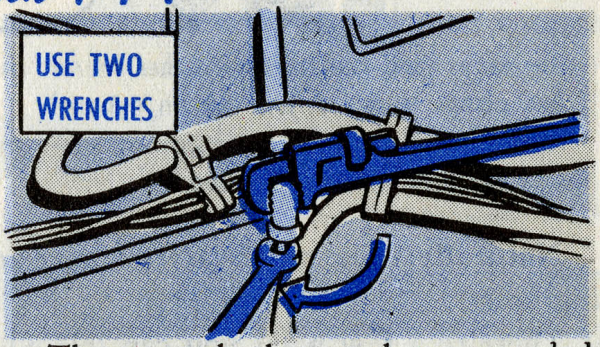
Now, all you do to remove the rope is give it a good yank downward—out she comes.

Pipe leakin'???

Is your M44 self-propelled howitzer's hydraulic power-pack reservoir's drain pipe dripping oil and making a lousy mess? Might be a good idea to check your vehicles right now and see if this is happening.



The main reason these pipes are leakin' is because some strong-arm giant is breaking the pipe when he tries to take out the plug with only one wrench. You see, removing that plug is a job for two wrenches.

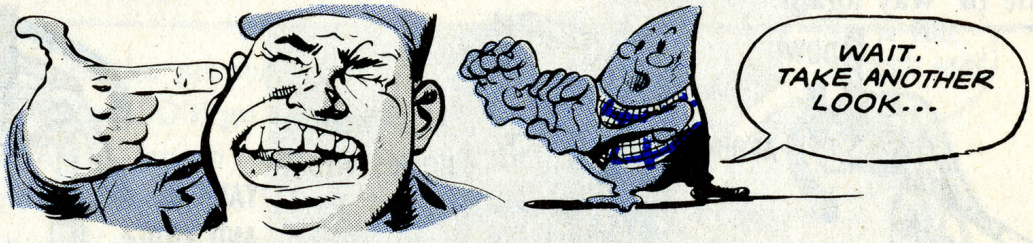


The reason both wrenches are needed is because the pipe is left suspended in mid-air after it has been inserted into the reservoir. So, if you don't use one wrench to hold the pipe from twisting while you're takin' out the plug, the pipe's had it—and gets busted.

'Bout the only thing left to do should your pipe spring a leak, is to order yourself some more ¼-in galvanized pipe FSN 4710-162-1016 (ENG) and get yourself a new pipe. If you'll just specify that you want the pipe cut to 11-in lengths, it should come to you already cut and threaded.

IN THIS CASE LOOKS AREN'T DECEIVING—

THE STORY ON THE RELIEF VALVE OF YOUR 5-TON TRUCK'S POWER STEERING



A careful look at some of your G744 series 5-ton trucks may lead you to the idea that some of the pressure relief valves have been left off the power steering unit. But, before you go ahead and get visions of that steering reservoir being blown clear out of that truck, take a longer, more careful look.

What you'll find is that there are two series of pumps for that 5-tonner.

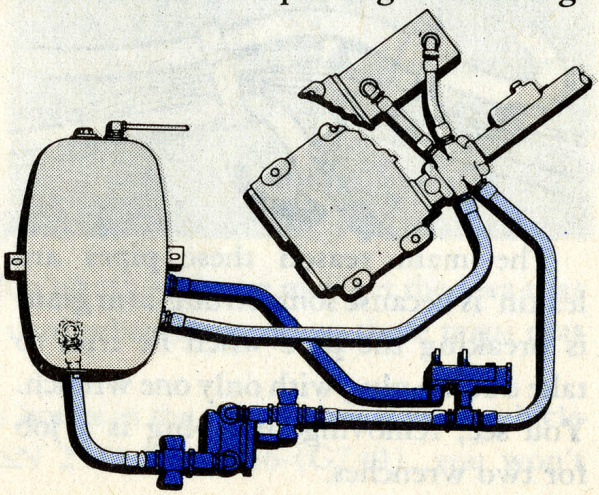
One series (and you can have either one of two pumps in this series) has an external relief valve—it's mounted on the steering gear-case in full sight, so you can see it.

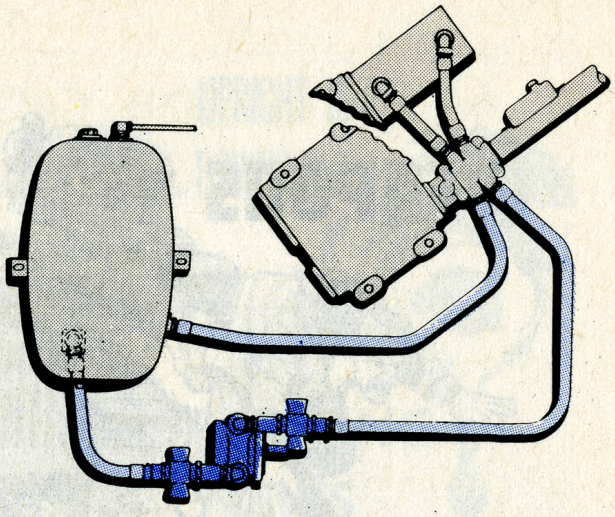
The other series, which is being put on your later model trucks, has an internal relief valve—the valve's built right into the pump and you can't see it.

Naturally, these relief valves relieve any build-up of pressure inside your steering units.

There're a few ways you can tell whether you have the external relief valve pumps or the internal valve pumps on your truck. First, if you spot that relief valve sitting on your steering gear case, you'll know you should have the older external relief valve pumps. Can't miss it if it's there—it's squatting there as big as life.

Another check—the system with the external relief valve pump is called the three-pipe (line) system. Find your pump. If you can trace a line from the pump to the relief valve, another line from the relief valve back to the oil reservoir, and still another line from the oil reservoir to the hydraulic control valve—that's the three-pipe or external relief valve system.





Now, if you don't spot a relief valve, you may have the pump with the internal valve in it—the new pump. To make sure, you check your lines again. This system, by the way, is called the two-pipe (line) system. You'll have one line coming from the pump to the hydraulic control valve, and another line going from the hydraulic control valve back to the oil reservoir.

Here's another way of telling the external relief valve pumps from the internal valve pumps. If it has a big-headed screw-type looking thing in the middle of it, it's a newer pump with the internal relief valve. If it doesn't have this thing, it's one of the older pumps.

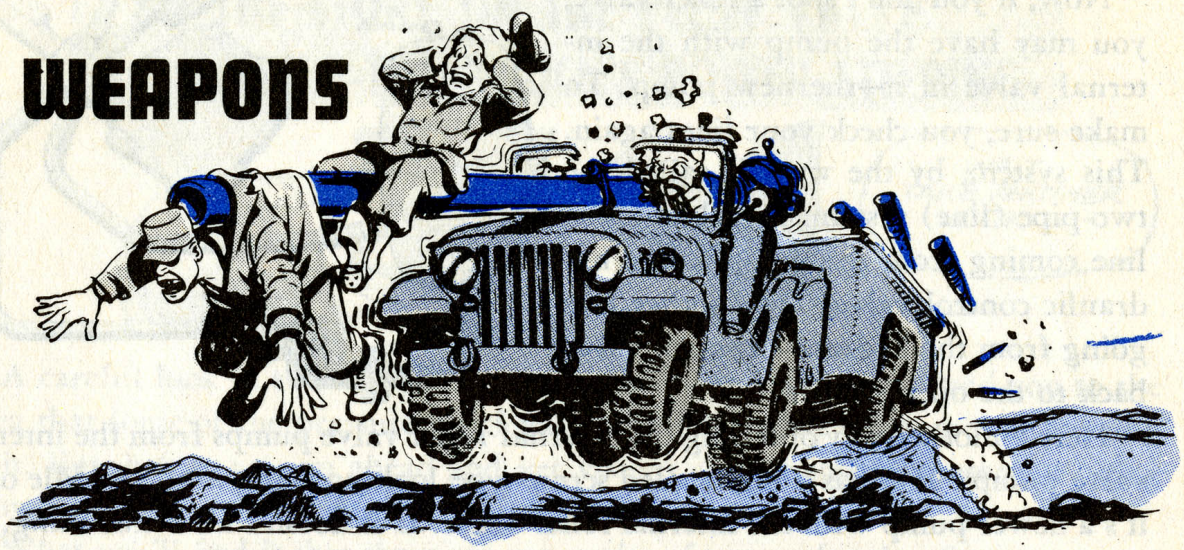
If, after these checks, you find that you have the older pump, just make sure you find a relief valve on the steering gear case. If you **don't** have one—leave that vehicle alone and call your outfit's mechanic. Drive it and you may find your steering system blowing up right in your face.

On the other hand, if you know you have the new pump—the one with the internal relief valve—you don't need any valve on the steering gear case.

Here's how these pumps break down:

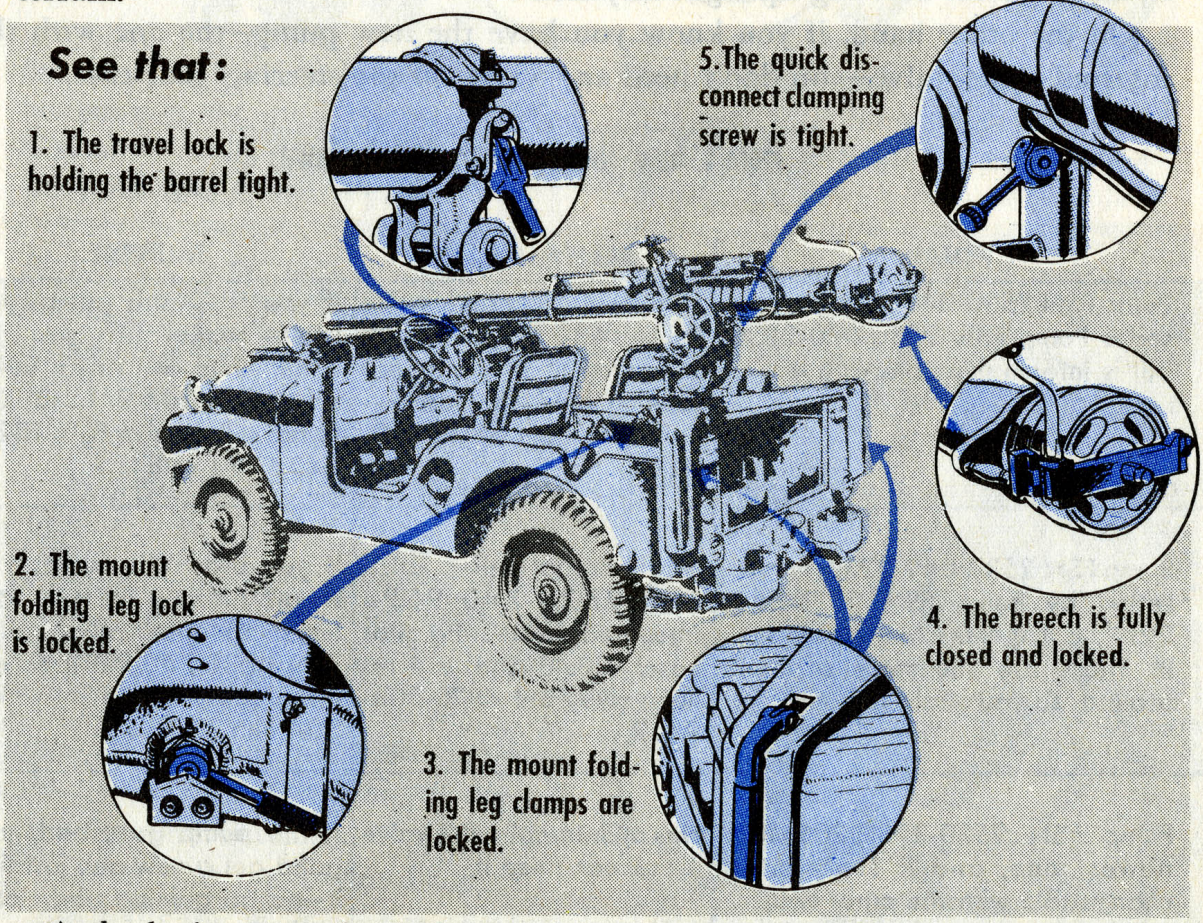
PUMP	RELIEF VALVE	MUSTS
Pump FSN 2530-040-2293; (supersedes Pump FSN 2530-040-2230, but is interchangeable with it).	Has external relief valve FSN 4820-304-9412 (mounted on steering gear case). Could, tho, use relief valve FSN 4820-740-9294.	If you draw this pump, you **must** make sure you get either external relief valve FSN 4820-304-9412 or external relief valve FSN 4820-740-9294 with it.
Pump FSN 2530-040-2230; (superseded by Pump FSN 2530-040-2293, but is interchangeable with it. There are still some of these around, so you might get one).	Has external relief valve FSN 4820-740-9294 (mounted on steering gear case). Could, tho, use relief valve FSN 4820-304-9412.	If you draw this pump, you **must** make sure you get either external relief valve FSN 4820-740-9294 or external relief valve FSN 4820-304-9412 with it.
Pump FSN 2530-318-8205; (the newest one, and it **isn't** interchangeable with the other two).	Has an internal relief valve—you can't see it.	If this pump goes bad, you gotta get a new one just like it—no bargaining and don't settle for any of the others. Got troubles if you do.

WEAPONS



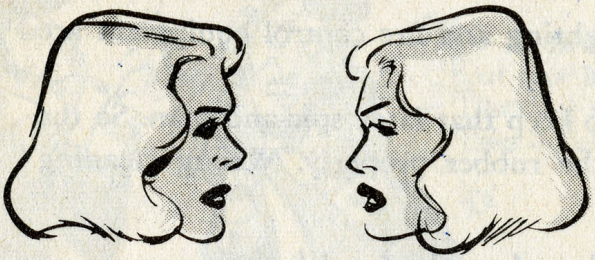
BEFORE YOU TAKE OFF...

There are five points to check to make sure your 106-mm recoilless rifle stays mounted upright on your M38A1C utility truck when traveling over rough terrain.



And take it easy on banked, curved and rough roads and while making sharp turns.

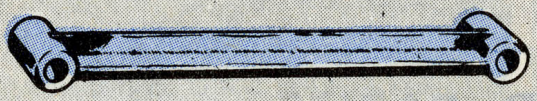
ROD TO ROD TALK



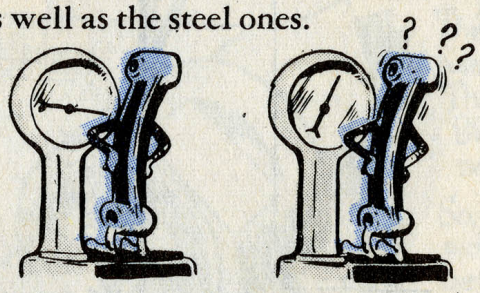
No sense in thinking the man in supply can't read stock numbers just because he sends you an aluminum connecting bipod rod for your 81-mm mortar M23A1 mount.

Sure . . . your requisition says
FSN 1015-600-8336, which
is the number for a steel rod.

But you get
the aluminum rod FSN 1015-730-5164
instead.

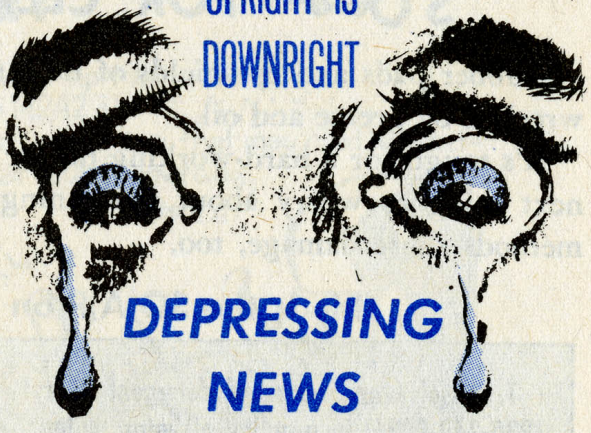


Course, you don't want the aluminum rods 'cause they haven't been standing up as well as the steel ones.



Trouble is . . . Ordnance is loaded with aluminum rods, and it'd be like throwing money down the mortar tube to give 'em the heave-ho. So, keep using the aluminum rods until they're used up. Then you'll get the steel ones.

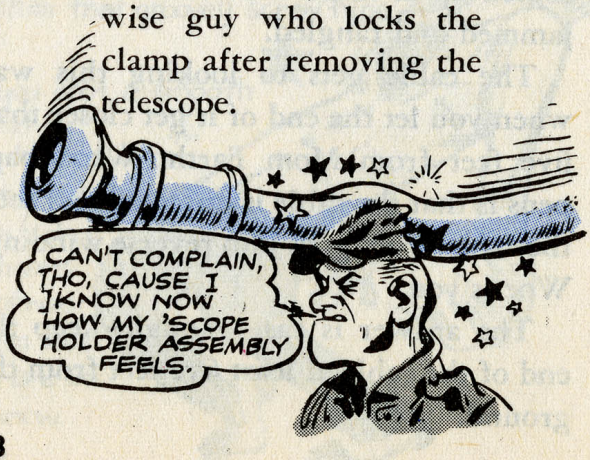
UPRIGHT IS DOWNRIGHT DEPRESSING NEWS



Upright is downright wrong when it comes to the holder assembly for the M97 (T156) telescope in the M41A1 tank. You know the assembly . . . it's part of the T178E1 telescope mount.

What's happening is that some guys leave the holder assembly clamp in the upright position after removing the telescope. Then the gun is depressed and—**C-R-U-N-C-H** . . . as the clamp jams against the turret-traverse unit-top support-bar. Chalk up one damaged holder assembly.

In other words . . . it's a wise guy who locks the clamp after removing the telescope.



SOAP FOR CLEANING RUBBER

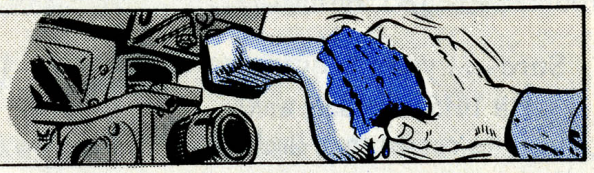
Rubber pads and eyeshields of tank sighting and fire control equipment are wrecked by grease and oil.

It's tough for a hard-working tanker to keep that latex spic-and-span. So the next thing to worry about is cleaning the rubber properly. Wrong cleaning methods cause damage, too.

This is the SO(A)P on cleaning that rubber:

1. Dissolve one ounce of detergent (FSN 7930-249-8036) in a gallon of warm water.

2. Wash rubber surfaces with solution, using a soft cloth or vinyl sponge (FSN 7920-267-4922).



3. Rinse clean with warm water, and let dry. When the rubber surfaces are thoroughly dry, apply technical talc (FSN 6810-270-9989).

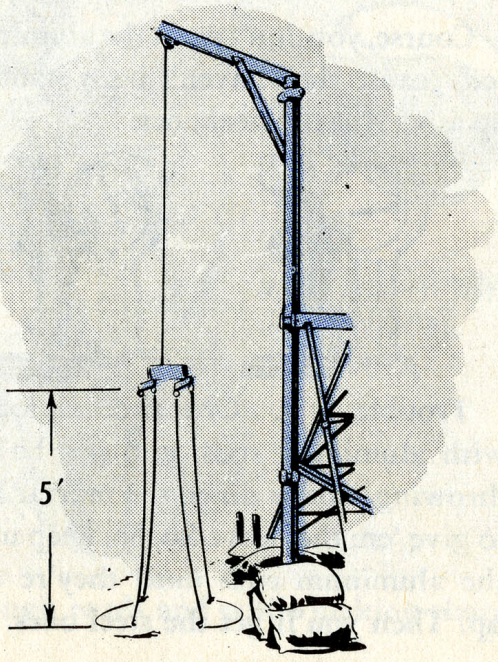
Even though the latex surfaces may not need cleaning every week, put some talcum on 'em once a week.

REEL SNARLED CABLES

Reminds a guy of a plate of spaghetti —the way the hoist cable on the acquisition antenna derrick for the M33 FCS gets fouled up at times. You know...kinked, jammed and tangled.

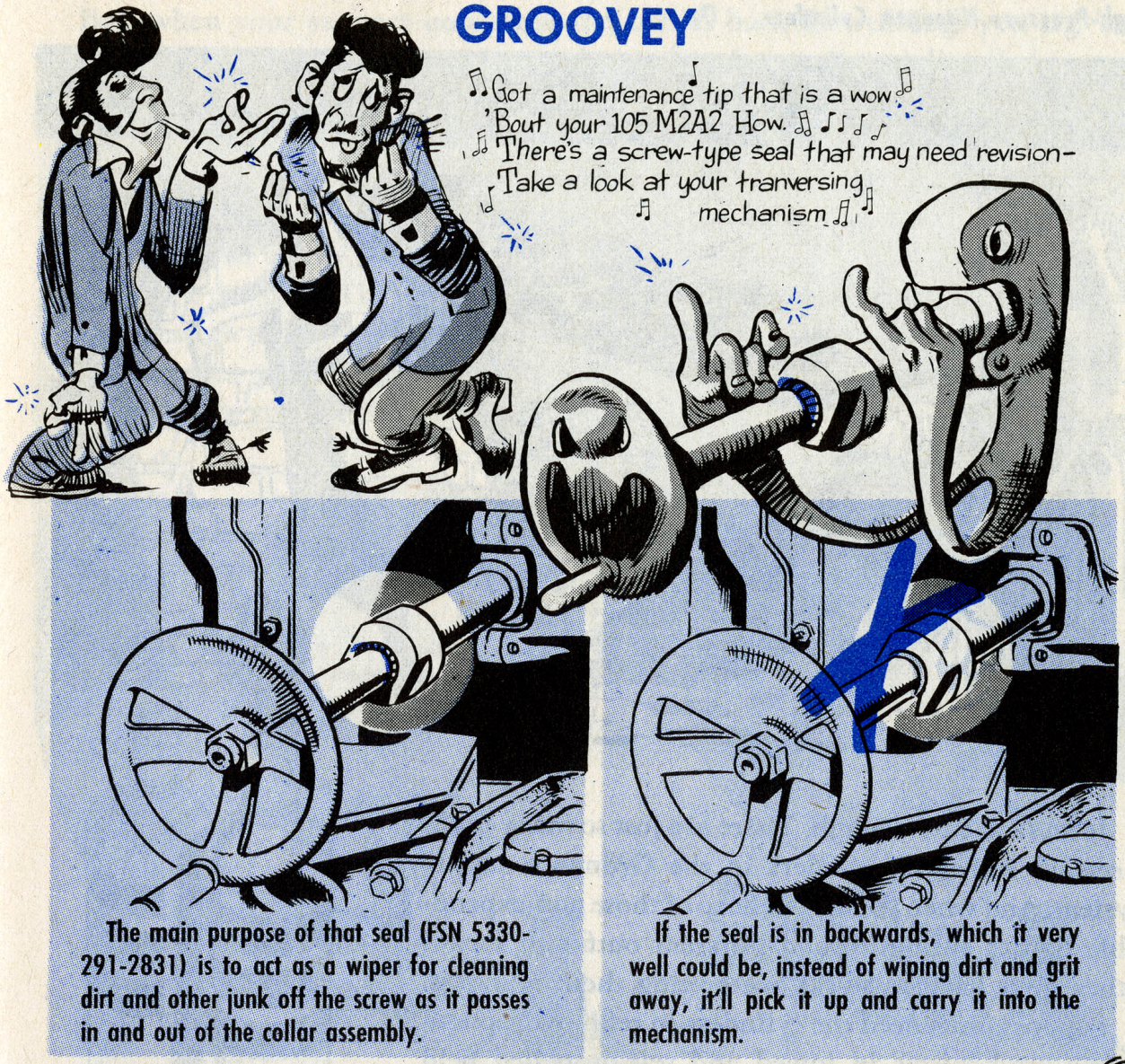
The cable gets to looking this way when you let the end of it get closer than five feet from Mom Earth. What happens is that the cable is unreeled and then the cable drum goes into reverse winding. Woe is you.

The answer is easy enough—keep the end of the cable at least five feet from the ground.



GROOVEY

♫ Got a maintenance tip that is a wow ♫
'Bout your 105 M2A2 How. ♫ ♪♪ ♪
♫ There's a screw-type seal that may need revision-
Take a look at your tranversing
♫ mechanism ♫ ♫



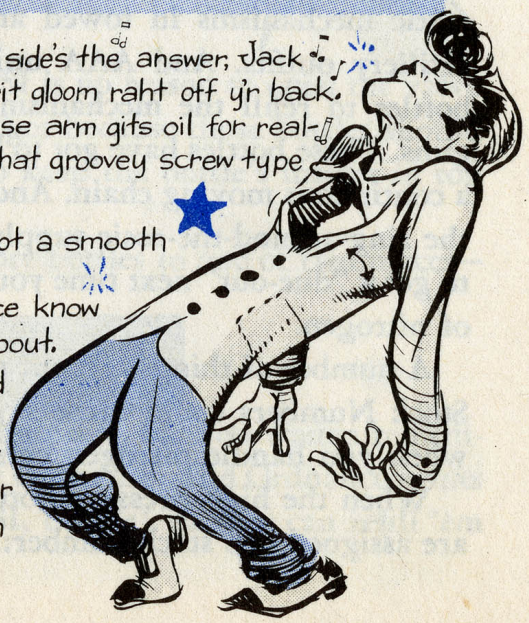
The main purpose of that seal (FSN 5330-291-2831) is to act as a wiper for cleaning dirt and other junk off the screw as it passes in and out of the collar assembly.

If the seal is in backwards, which it very well could be, instead of wiping dirt and grit away, it'll pick it up and carry it into the mechanism.

♫ The groovey side's the answer, Jack ♫
♫ Keeps dirt-grit gloom raht off y'r back.
♫ That traverse arm gits oil for real-
♫ Oooohhh that groovey screw type seal

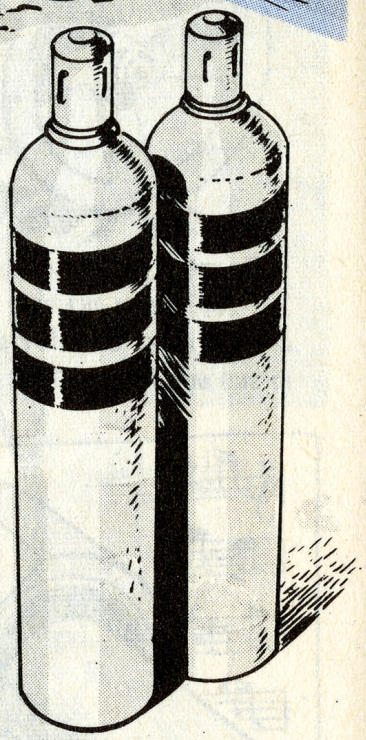
So, if you spot a smooth side out
Let ordnance know the whereabout.

Smooth sahd out means lots of woe-
But them thar boys are in the know.



The Bottleneck In
High-Pressure Nitrogen Cylinders . . . Or

THE CASE OF THE MISSING BOTTLES



It's a fact, sure enough. There are just so many high-pressure nitrogen cylinders in the Ordnance supply system. And when you have a heap of those non-expendable bottles sitting around different outfits, it means other guys have to sweat out getting their cylinders.

Support units need the cylinders to refill hydropneumatic mechanisms in towed and self-propelled field artillery outfits. And AAA units themselves use the bottles to refill the mechanisms in their antiaircraft guns. These bottles have got to keep moving—just like a continuous moving chain. And a stoppage or kink in the ring-around-the-rosie supply chain may cause you to get a "due-out" next time you requisition a cylinder of nitrogen.

A number of things can put that supply chain out of whack—even the Federal Stock Numbers could cause a jam-up of cylinders. "Numbers" is right 'cause when you handle nitrogen cylinders, you use two stock numbers.

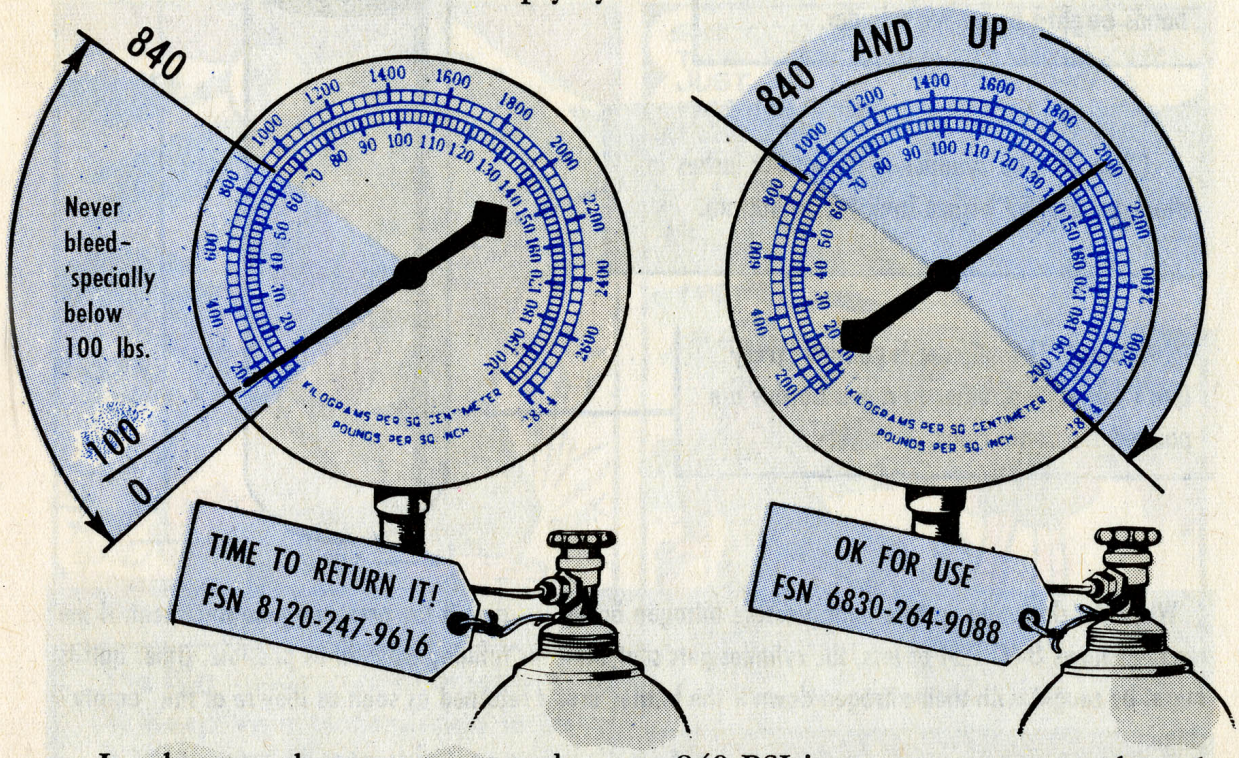
When the high pressure bottles are refilled, they get 3,500 worth of PSI and are assigned this stock number: FSN 6830-264-9088. The number is the one for

nitrogen gas only . . . and is the same one used to requisition the cylinder of gas. But, when your support unit sends the bottles back for refilling, you tag 'em: FSN 8120-247-9616. That's the stock number for an "empty" cylinder.

It makes sense 'cause in one case you're getting gas . . . and in the other you're sending back an empty bottle.

The word "empty" in the stock number could be the cause of a nitrogen cylinder bottleneck. You see . . . when it comes to those high pressure bottles, empty doesn't mean empty.

Here's the deal. The cylinders are used until the pressure drops to 840. Once the pressure drops that low, there aren't enough PSI left in the bottle to jack up the nitrogen pressure in a weapon. So the bottle is called empty and from then on it's to be treated like an empty cylinder.



Just because that pressure gets down to 840 PSI is no reason to open the valve and let the rest out. Keep what pressure you've got because those bottles should always have at least 100 PSI in them. That's to keep the bottle's insides in top shape by keeping out all moisture.

Your Ordnance support unit will return empty bottles to one of two places—whichever is closer:

Raritan Arsenal, Metuchen, N. J., or
Mt. Rainier Depot, Tacoma, Wash.

Most of Uncle's gas cylinders belong to the Engineers, but you wanna remember that these nitrogen bottles are the property of Ordnance. And Ordnance wants 'em back soon's they're empty (down to 840 PSI, that is) so they can refill 'em and get 'em back to you.

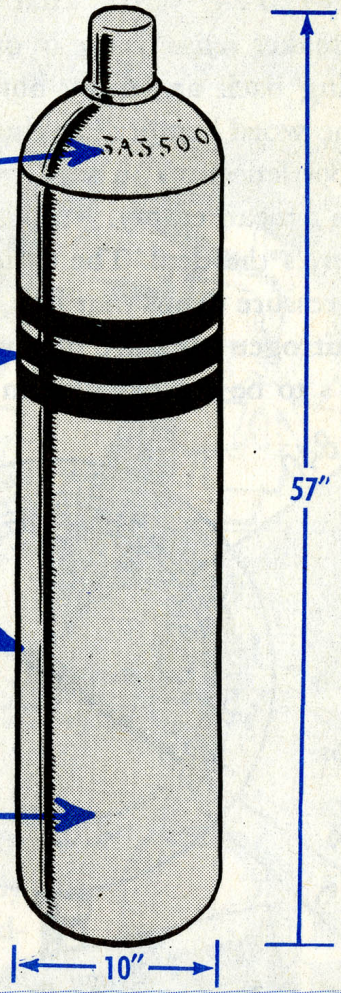
It's easy enough to spot a high-pressure nitrogen gas cylinder. Here are the clues:

Clue 1. The letter and numbers **"3A3500"** are stamped on top of the cylinder.

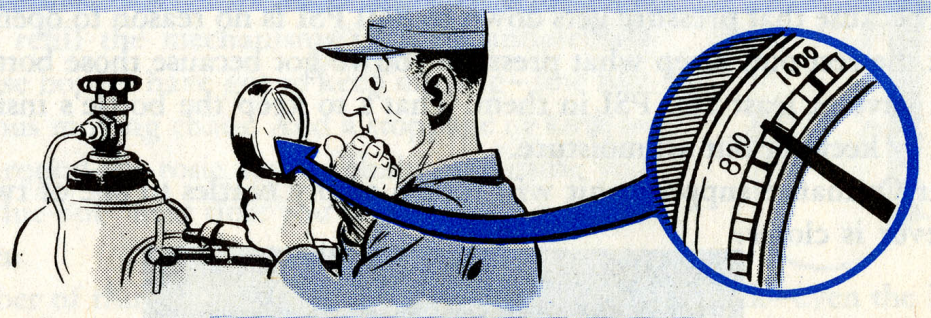
Clue 2. Three black bands are painted around the cylinder. At least the bands **oughta** be on the cylinder.

Clue 3. The cylinder is about **10** inches in diameter and **57** inches from top to bottom.

Clue 4. The cylinder is painted **gray.** Don't forget, tho, other nitrogen bottles are painted the same color.

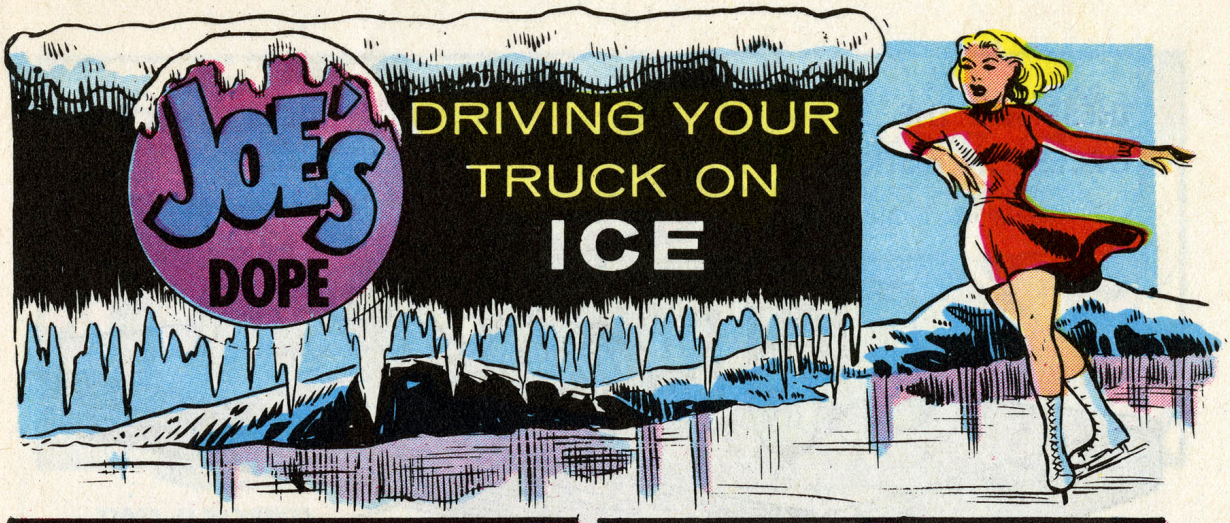


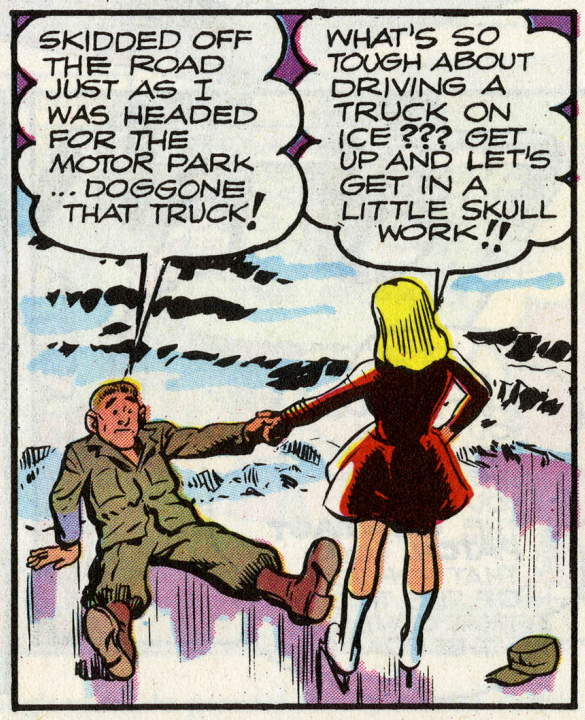
When the clues add up to a high pressure nitrogen bottle . . . give it the pressure gage treatment. If the reading shows **840 PSI** or less, the cylinder gets sent back for refilling as soon as possible. Other outfits might be caught with their nitrogen down if the bottles aren't returned as soon as they're at the "empty" stage.



SB 9-113 (14 Dec 54) puts it this way:

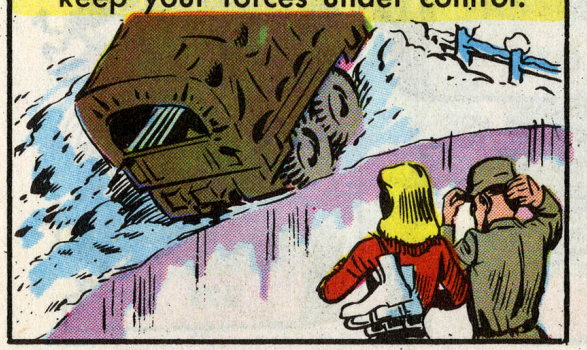
"High-pressure nitrogen cylinders will be issued on an exchange basis only. A quantity of empty nitrogen cylinders must be returned to the supply point in order to obtain an equal quantity of filled cylinders."



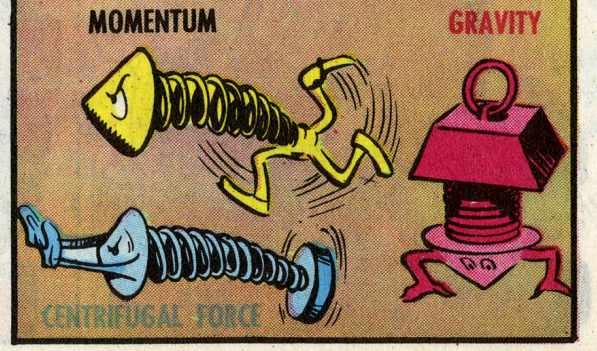


The **Big** things to remember are:

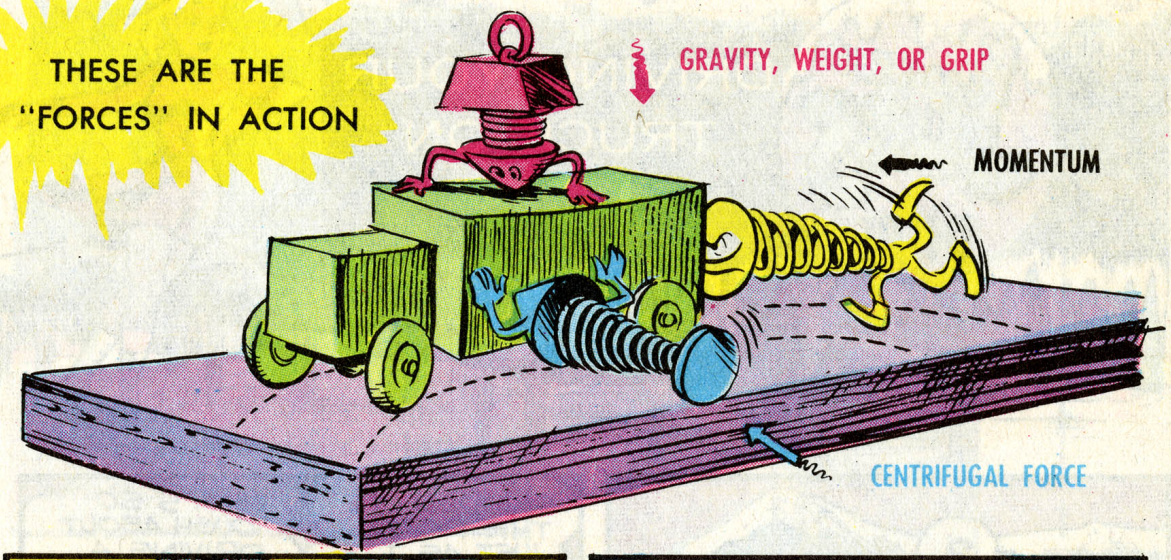
1. Keep your transmission in as high a gear as possible—consistent with safety.
2. Avoid jerky shifts and sudden changes of direction . . . that is—keep your forces under control.

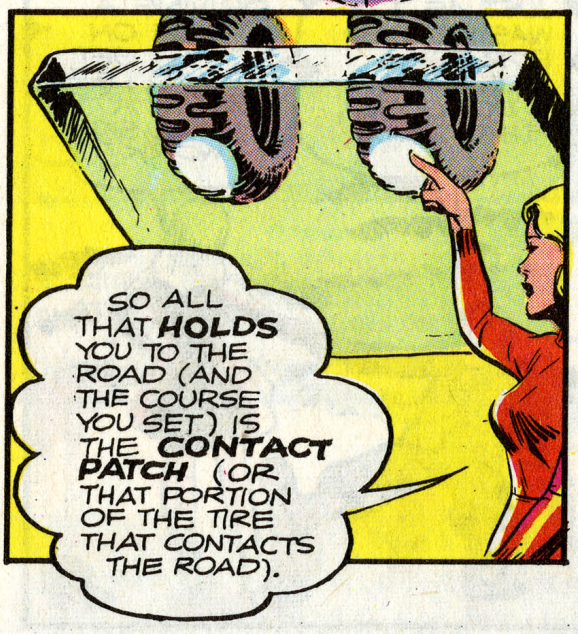


There are three natural FORCES working on your truck . . . trick is to get them working **for** you . . . under your control sorta!

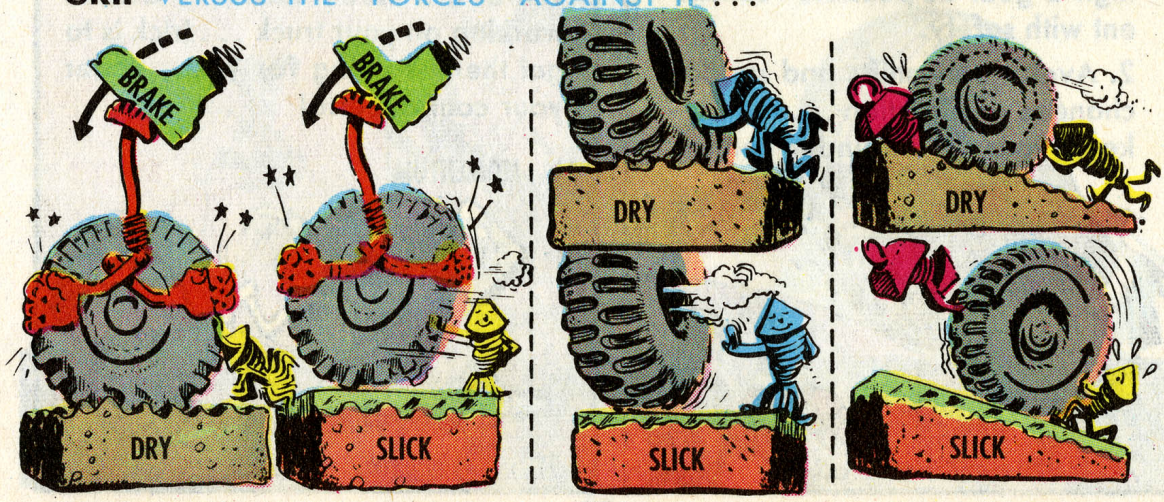


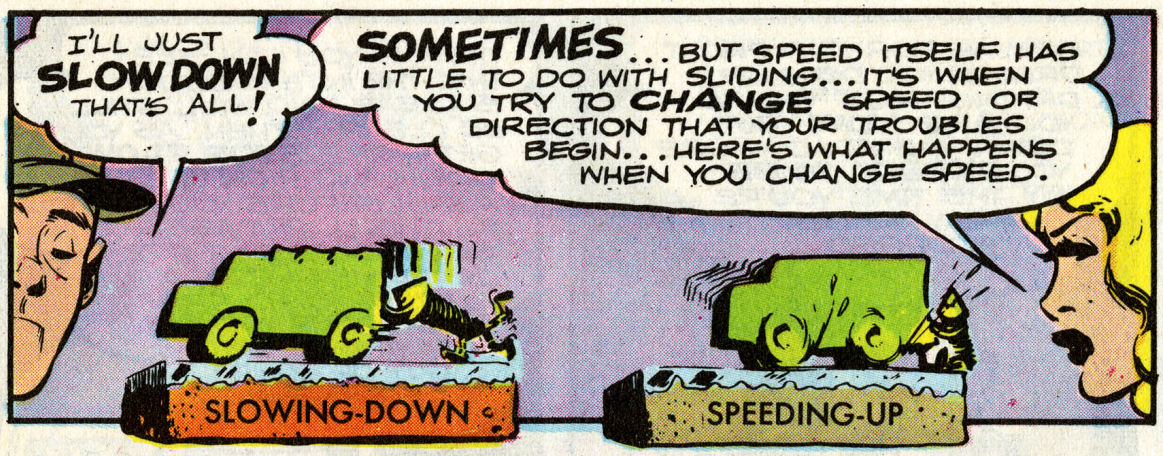
THESE ARE THE "FORCES" IN ACTION

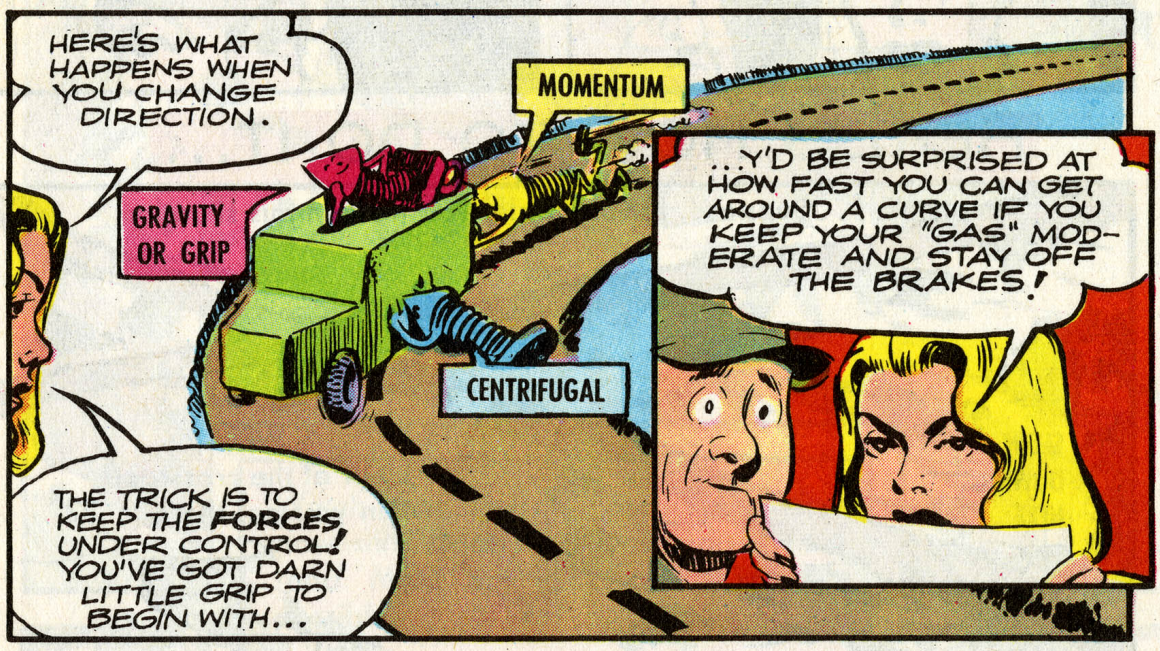




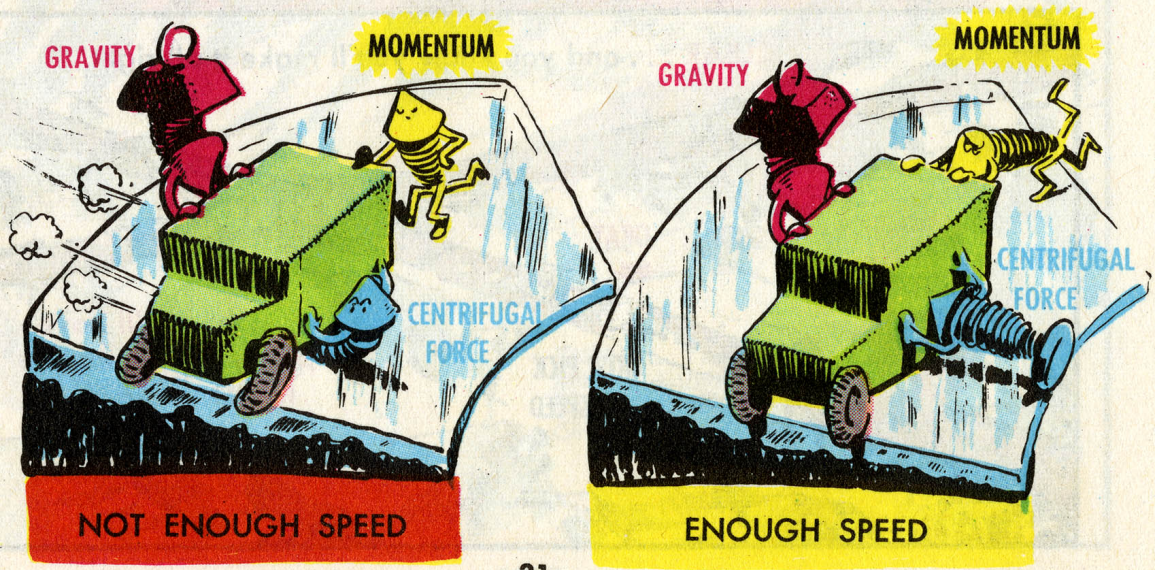
SLIDING AND SKIDDING DEPEND UPON THE AMOUNT OF **ROAD-GRIP** VERSUS THE "FORCES" AGAINST IT ...

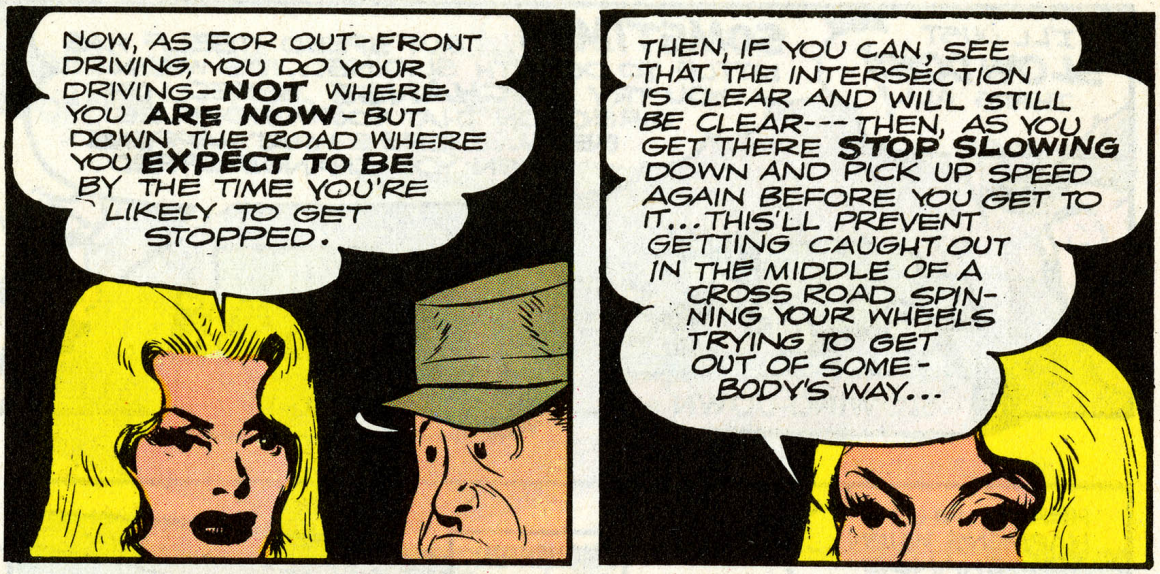




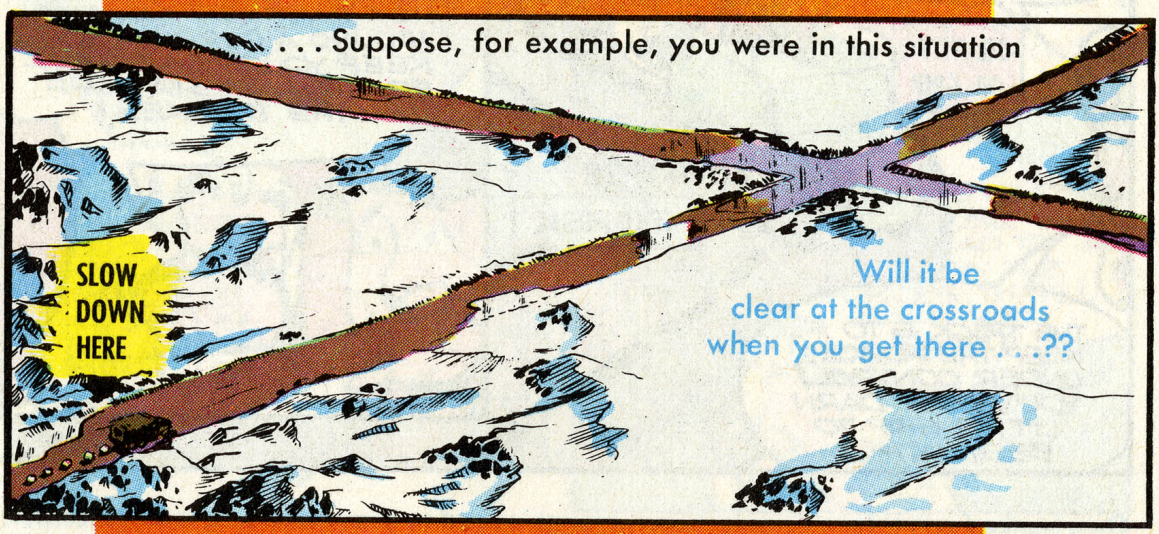


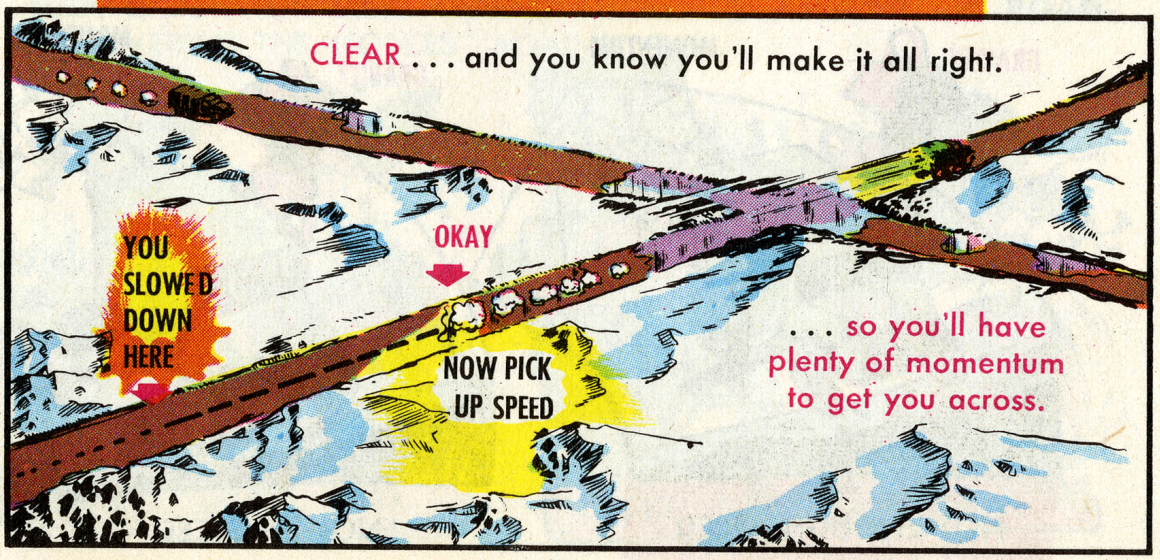
On a banked curve, for example, keep enough speed to prevent sliding into the center.

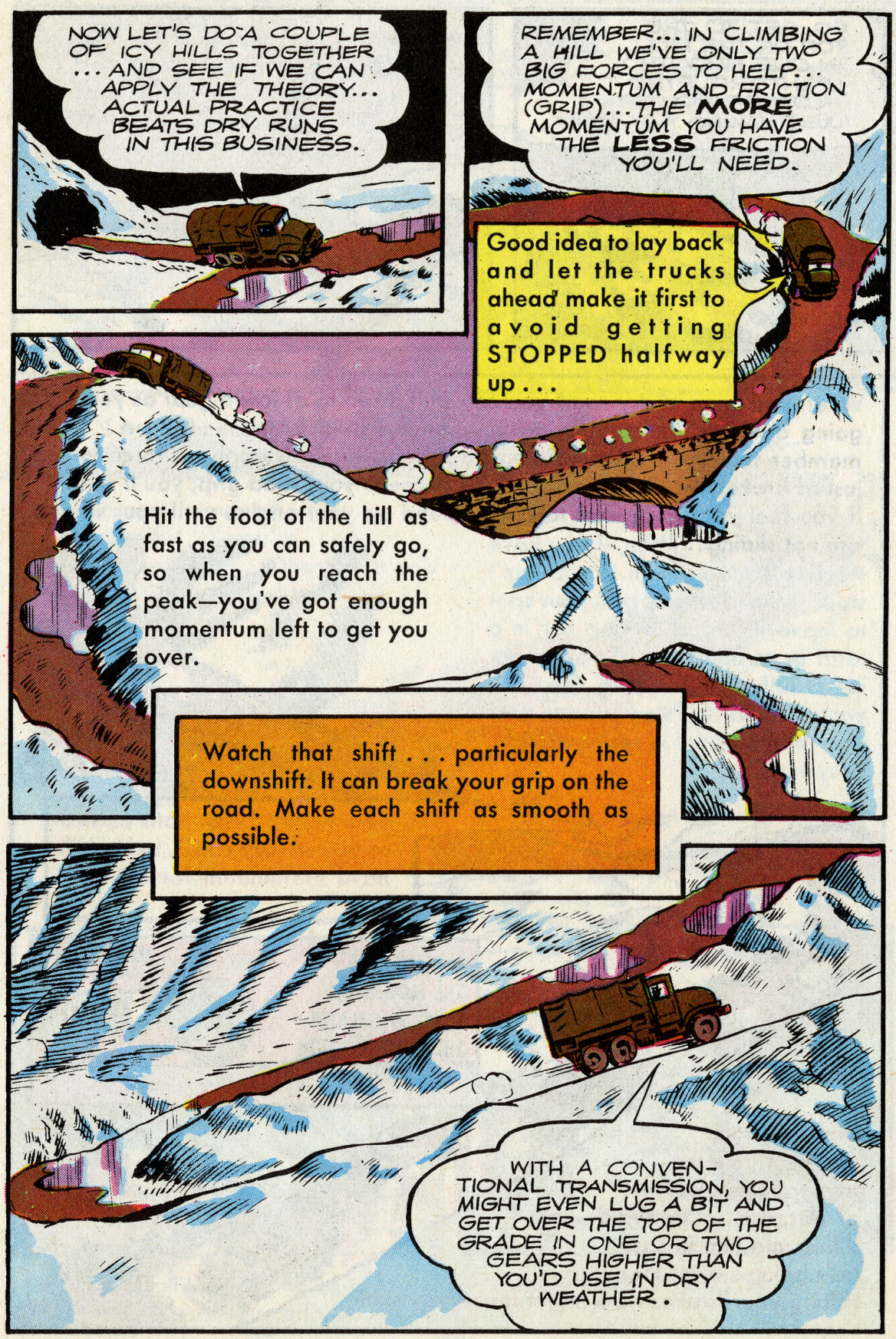


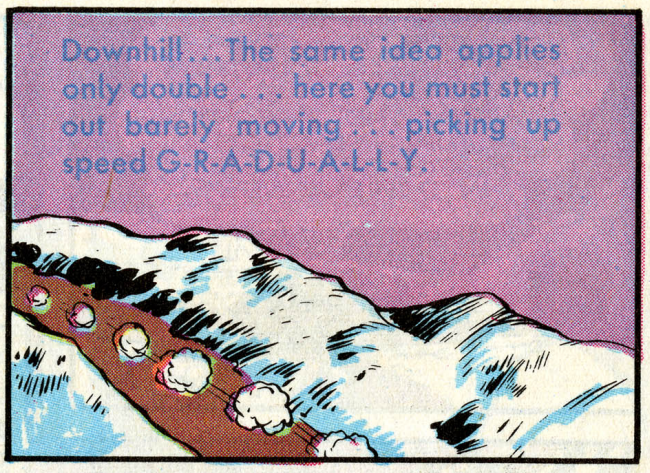


HERE'S HOW TO DO IT...





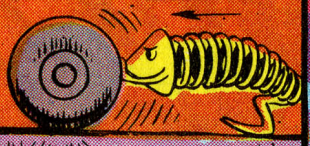

NOW LET'S DO A COUPLE OF ICY HILLS TOGETHER ... AND SEE IF WE CAN APPLY THE THEORY... ACTUAL PRACTICE BEATS DRY RUNS IN THIS BUSINESS.
REMEMBER... IN CLIMBING A HILL WE'VE ONLY TWO BIG FORCES TO HELP... MOMENTUM AND FRICTION (GRIP)... THE MORE MOMENTUM YOU HAVE THE LESS FRICTION YOU'LL NEED.
Good idea to lay back and let the trucks ahead make it first to avoid getting STOPPED halfway up...
Hit the foot of the hill as fast as you can safely go, so when you reach the peak—you've got enough momentum left to get you over.
Watch that shift . . . particularly the downshift. It can break your grip on the road. Make each shift as smooth as possible.
WITH A CONVENTIONAL TRANSMISSION, YOU MIGHT EVEN LUG A BIT AND GET OVER THE TOP OF THE GRADE IN ONE OR TWO GEARS HIGHER THAN YOU'D USE IN DRY WEATHER.



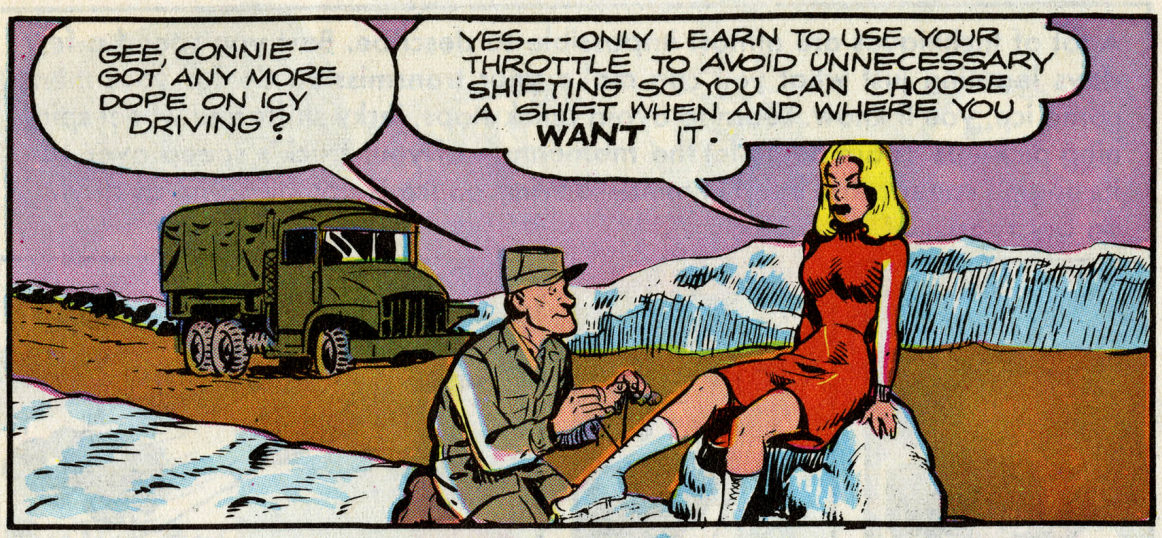
When you're on a dry road you can shift down to as low a gear as you like, going down in that gear using your engine as a brake . . . But **on** ICE remember that the engine holding back your wheels is applying force to 'em just as brakes do. If this holding force exceeds your road grip, you'll skid . . . If you feel your truck start to slide—speed up your engine until your wheels are not sliding.. Y'see, if you have steering control, even if you can't stop, you can at least pick your spot to leave the road or stop her in a 'drift or scraperbank. If you're going a little too fast and must use your brakes to slow up . . . give your brake pedal a series of light, easy taps.

You should hit bottom as fast as you **safely** can . . . so you'll have momentum for the next hill.

REMEMBER: IF THE MOMENTUM FORCE IS GREATER THAN THE FRICTION . . . YOU SLIDE.



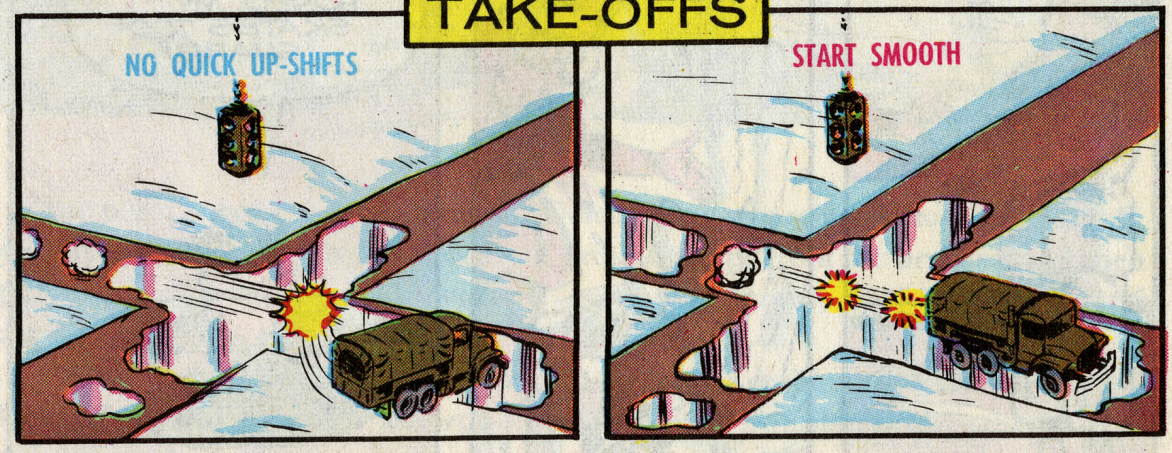
Downhill, too, you best give the truck ahead plenty of distance . . . to avoid piling into him in case he's going slower than you. Hitting your brakes now might make you skid.



On curves—slack off your speed a bit 'till you're around a curve . . . then hit it so's you'll pick up speed on a straight-away.

Watch your speed when you approach a stop—let up on your throttle, and use the holding power of your engine to slow you down. This gives you steady "road grip."

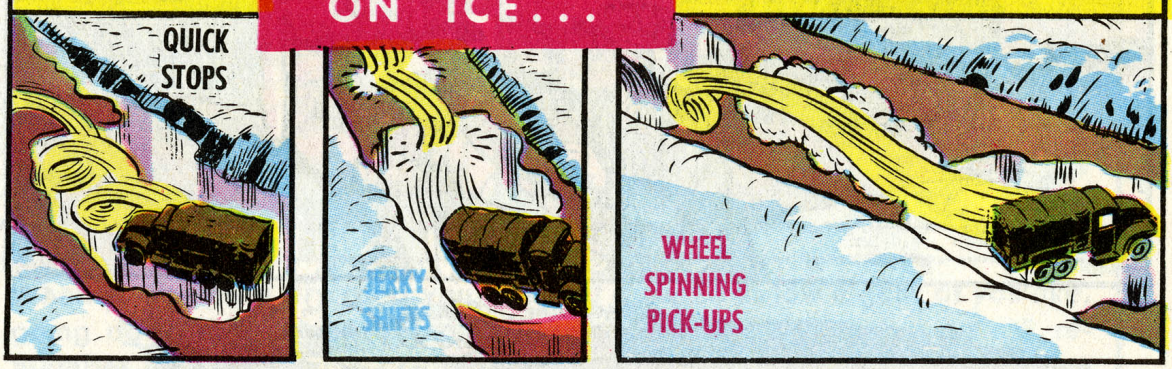
TAKE-OFFS

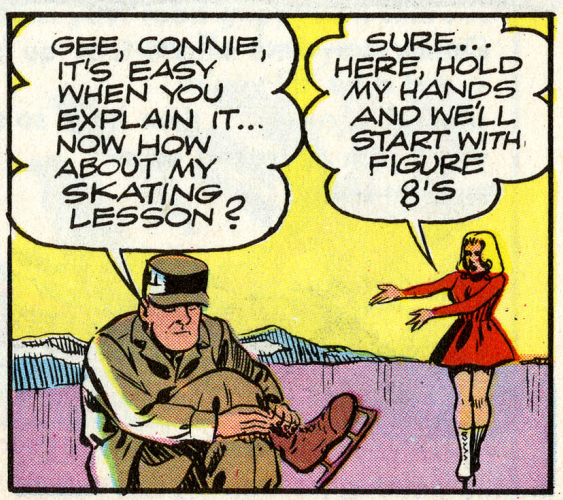


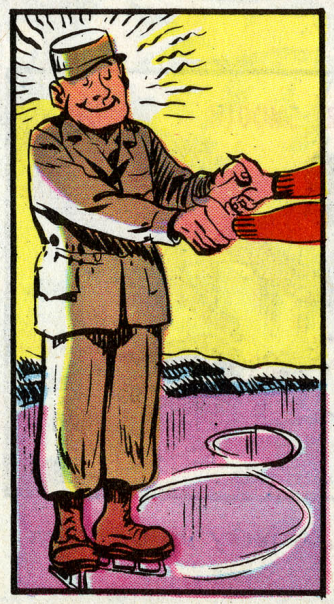
Transmissions are made to give you s-m-o-o-t-h shifts. A jerky up or down shift may break your grip on the road.

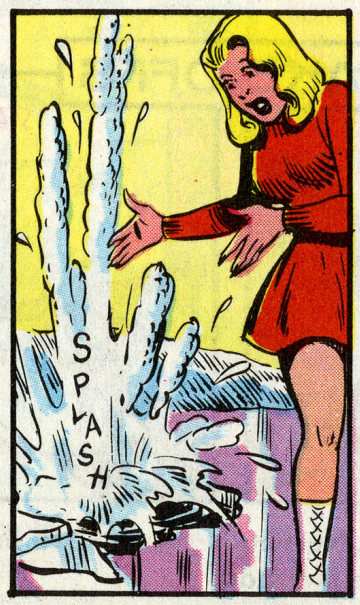
A lot of techniques are almost impossible to describe. Best you spend a few days learning just what you can make your transmission do for you; then, come ice, you'll know. Learn to avoid quick stops, jerky shifts and wheel-spinning pick-ups. Learn not to let the momentum of your truck's speed over-run its engine speed. And keep in mind—driving on ice is not the same as driving on dry road.

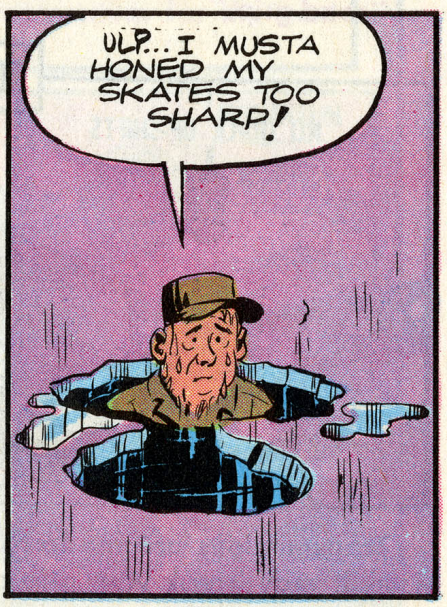
ON ICE...

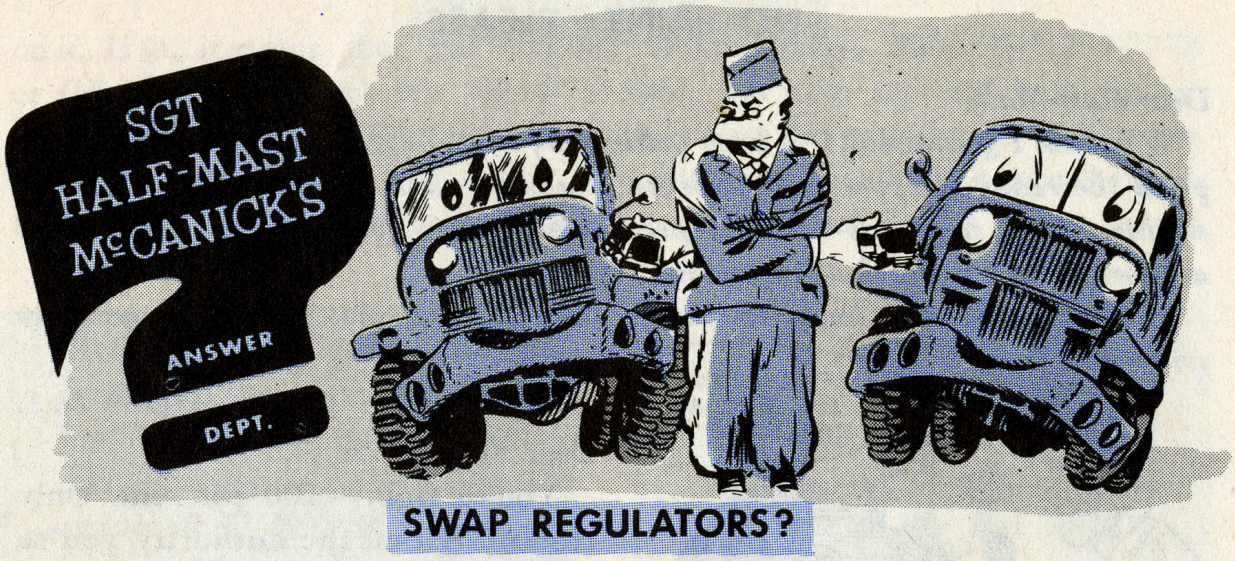












SWAP REGULATORS?

Dear Half-Mast,

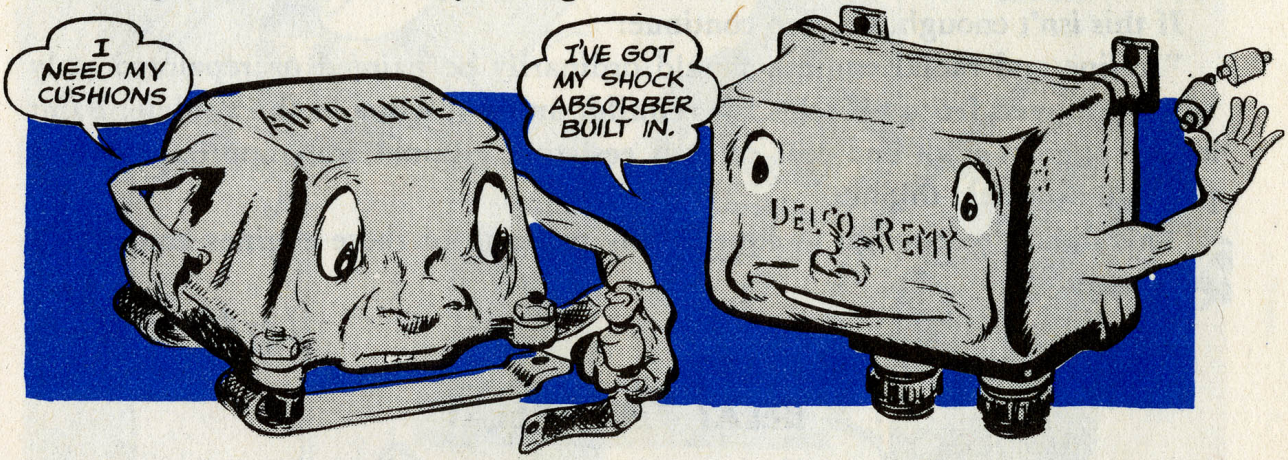
Are the generator regulators interchangeable on the M-series wheeled vehicles?

M. R. H.

Dear M. R. H.,

Yes, for all practical purposes, they are. You'll encounter slight differences in the mountings, but they'll give you no trouble.

To replace your Delco-Remy regulator with an Auto-Lite, you install the four mounting cushions for the Auto-Lite regulator, FSN 2920-737-4922 and the four ground straps, FSN 6150-737-4965 directly on the firewall using the original mounting holes. Then set on your regulator.



The other way around, to mount a Delco-Remy where an Auto-Lite came off, you remove the mounting cushions and ground straps from the bracket, and then put on the Delco regulator with its grounding straps, FSN 2920-737-6366 attached.

You see how it is, the Auto-Lite box wants rubber cushions under it, while the Delco-Remy has its shock absorption built into it. But electrically, they'll give you the same results.

Half-Mast

NO PAINT — PLEASE

Dear Half-Mast,

What am I gonna do? I've been yelling my head off, telling these guys not to paint the radiator upper tanks, rocker arm covers and cylinder blocks of their engines. They say—nuts—it looks pretty—and they're gonna do it. And, what authority can I quote that'll stop 'em?

Give me a hand. I know that with paint on 'em, that engine temperature will rise.

MSgt A. K. S.

Dear MSgt A. K. S.,

You're right — 100 per cent. Only trouble is that the authority you're looking for is in a third echelon manual. But you can feed it to your second echelon boys.

Round up a copy of TM 9-2851 (Dec 47)—mebee your Ordnance support will lend you theirs. Turn to para 147—and shove it right under the eyes of the guys doing the painting. This paragraph says:

"Engines received in an unpainted condition must remain in that condition. Paint will frequently impair the heat conductivity of metal and should not be applied to engines unless it is the manufacturer's policy to do so."

If this isn't enough, you can continue:

"In-line and radial engines should ordinarily be painted or repainted **only when removed from vehicles for rebuild, and not when in the vehicle.** Paint in-line engines with one coat of **heat resisting enamel** with approximately 5 per cent synthetic thinner."

This should be enough to squelch any painting of those engines and associated parts.

Half-Mast

BELAY THAT RELAY

Dear Half-Mast,

I keep gettin' water in the starter and master relays on my M41 tanks. Comes cold weather they freeze up on me. What do I do about it?

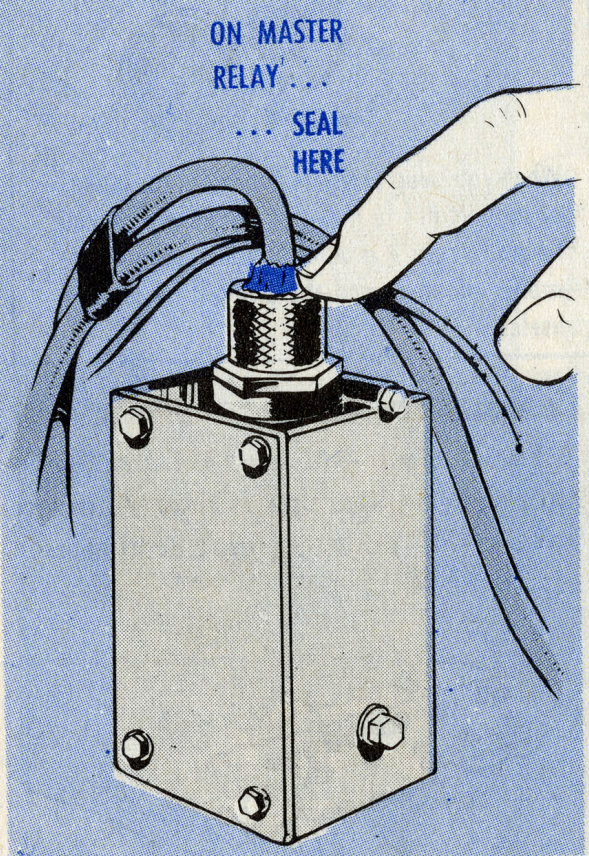
Sp2 H. S. T.

Dear Specialist H. S. T.,

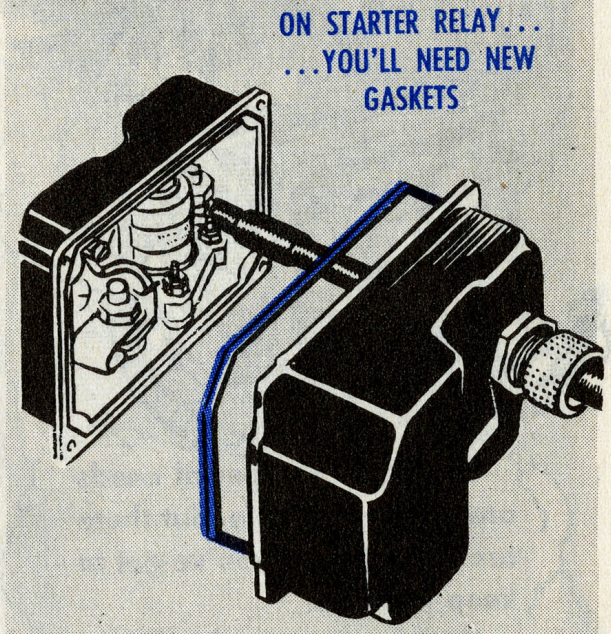
First, go look at the number plate on the rear hull plate of your tank, (about 10 inches above the right towing eye). See if the number "41" has been stamped

on it. If so, it means that the original Bendix relay, FSN 5945-752-7778 or GE relay, Ord Stock No. G254-7355961, has been replaced by a Cutler-Hammer relay, FSN 5940-798-3413. If yours hasn't been stamped, look inside. The Cutler-Hammer is in a black box. Happens your relays haven't been changed, change 'em. Return Bendix and GE relays to stock for use as master relays.

Now, to prevent leakage into a Bendix relay (your master relay), you hand tighten the cable gland nut, and then take some sealing compound, asbestos, GK, FSN 8030-264-5114, and build up a fillet between the cable and the nut. This prevents water collecting in the depression there and seeping down into the relay.



On the Cutler-Hammer relays, the problem is tougher. See Ordnance, and they'll either give you new gaskets, Gasket, rubber, 0.140 diam. (upper and lower half; relay box) FSN 2920-039-8730, to put into your boxes, or they'll put 'em in for you. If I was doing it, I'd use non-hardening gasket cement FSN 8040-245-7031 to seal 'em. Then gunk up the cable fitting same as for the Bendix master relay.



Then, when your relays are as waterproof as you can make 'em, get after the boys to keep water out of the engine compartment as much as possible. No cleaning with a pressure hose.

Half-Mast

CHEMICAL

How To Live With your M3A2 Smoke Generator...

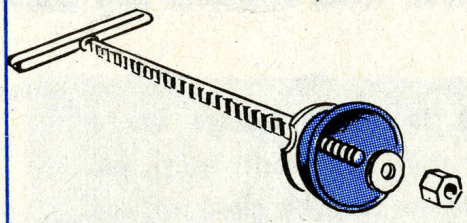
When The Mercury Drops

The smoker's special needs are few and simple, but there are some things you've got to keep in mind.

Without proper cold weather care, she'll never warm up for you.

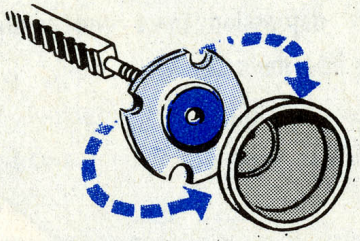
Magneto-Air Pump

When you're operating in a frosty clime, your first concern is your magneto-air pump.



The leather plunger in the pump comes out and is replaced with the rubber plunger which you carry around in the spare parts box.

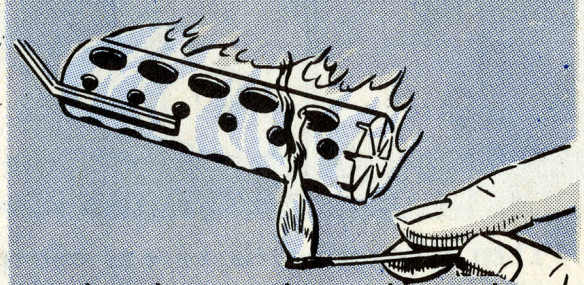
But, watch yourself here.



When you swap plungers remember the plunger support has to make an about face. If you forget to turn it around, it won't support the rubber plunger—and the pump'll be next to useless.

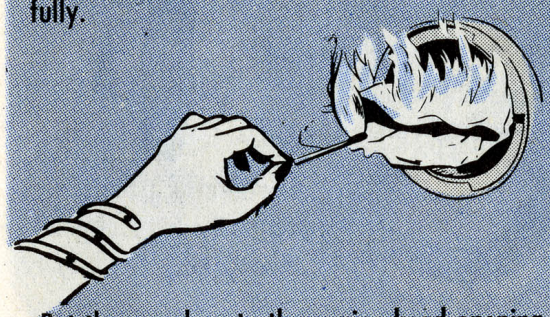
Combustion Chamber Warm-Up

For this job you need the preheater (stored in the spare parts box). And you have to pull out the engine head assembly.



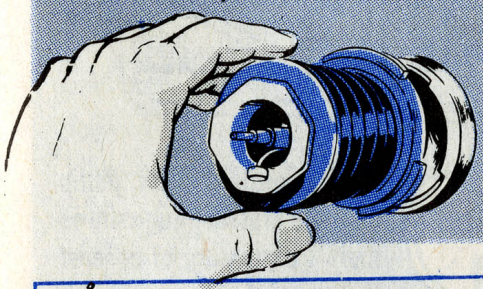
Dip the preheater's wick in gasoline. Touch a match to the wick and poke the lighted preheater inside the combustion chamber.

If you're fresh out of preheaters, or if you're bucking a hard wind, soak a handkerchief-sized rag in gasoline and place it inside the chamber. For fast and complete burning, crumple the rag loose-like . . . don't wad it. And handle that gas-soaked rag mighty carefully.



Put the rag close to the engine head opening and light a match to it. But keep your hide away from that opening.

When the rag burns out, replace the engine head assembly.



Some Choking Will Help

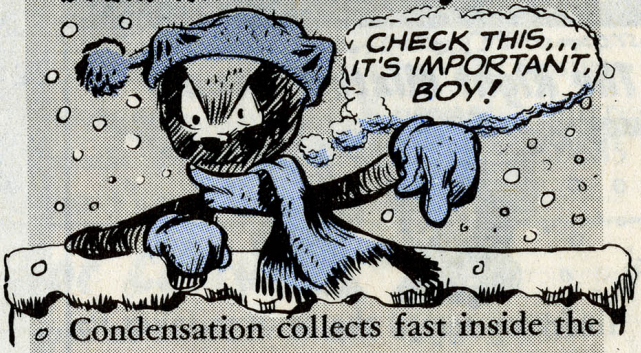
When you have to choke the engine—here's how you go about it.

Make sure that all fuel valves are open.

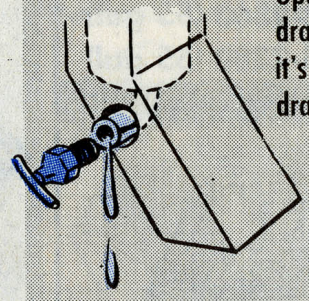
Close off the venturi section of the engine head with a cloth or your gloved hand.

Operate the starting air pump until the engine starts, then uncover the venturi.

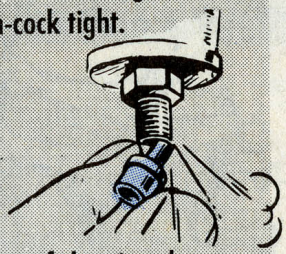
Drain Air Pressure System



Condensation collects fast inside the pressure system. If it's allowed to freeze up it means curtains for your smoke screen. So, during operation in extremely cold temperatures, the pressure system must be drained every 20 minutes like this:

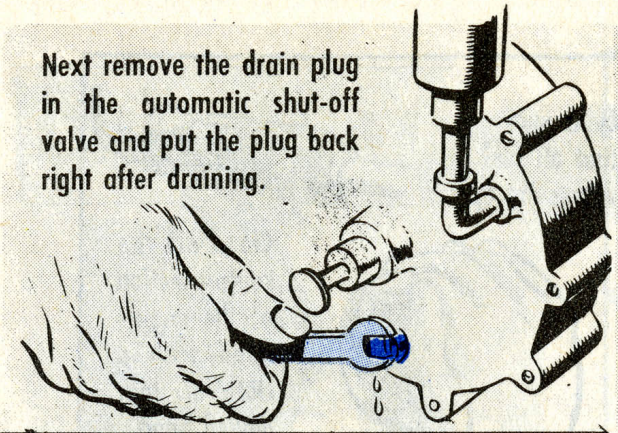


Open the pressurizing valve drain-cock all the way. When it's done draining, close the drain-cock tight.



Then press the center stem of the air valve on the pipe tee to release moisture in the air valve. (If the tee's frozen, you'll have to take it off and get it warmed up until it's completely thawed).

Next remove the drain plug in the automatic shut-off valve and put the plug back right after draining.



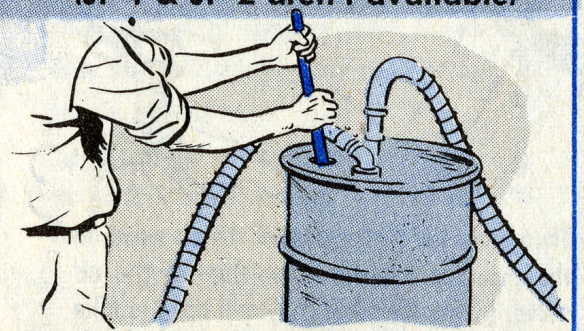
In case ice forms inside the pressure hose (you'll know it—the pressure gage reading'll drop—so will the smoke flow), you'll have to work the hose (with a bending motion) to break up the ice block and force it into the drum.

The Right Mixture Counts

In frosty temps the smoker takes its fog oil with a mix:

Temperature	SGF2	Kerosene or JP 3 or JP 4
0 to −25°F	50%	50%
−25 to −40°F	40%	60%

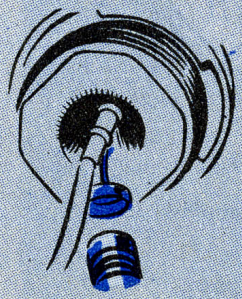
JP 3—FSN 9130-273-2360 (55 gal)
JP 4—FSN 9130-273-2380 (55 gal)
(JP 1 & JP 2 aren't available)



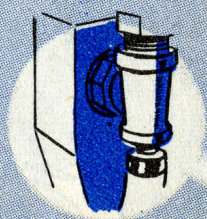
Put the fuels in a 55-gallon drum, push a wooden paddle thru the top bung hole, and stir 'em up real good.

Drum Pressurizing

At below 32° F even a full drum of fog oil needs to be pressurized by hand before you can get the smoker started. Here's how you go about it.

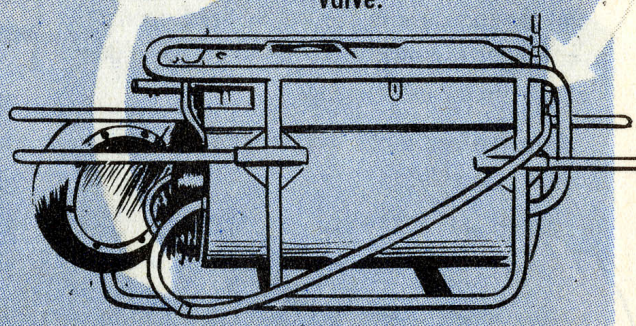


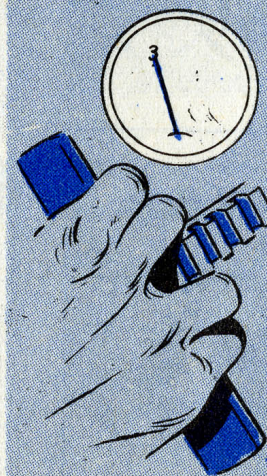
Unscrew the end of the air pump hose from the flowjector assembly and screw it onto the manual pressurizing hose.



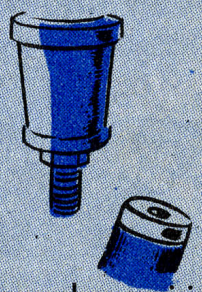
Unscrew the cap from the air valve in the tee in the oil pressurizing valve . . .

. . . and attach the other end of the manual pressurizing hose to the air valve.

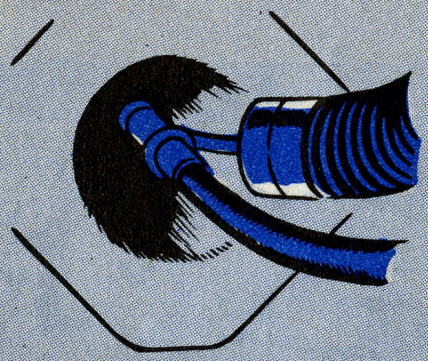




Then operate the air pump until the pressure gage shows there's a pressure of at least three pounds per square inch in the fog oil drum.



Next you disconnect the manual pressurizing hose from the tee in the oil pressurizing valve.

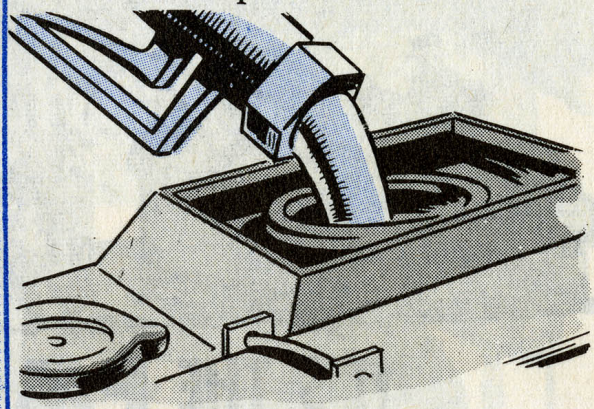


Put the valve cap back on. Disconnect the manual pressurizing hose from the air pump hose and screw the air pump hose back onto the flowjector assembly.

Now you can stow the manual pressurizing hose in the tool box.

For Quick Startin'

Keep your gasoline supply properly sealed and protected from contamination. It'll help cut down condensation in the fuel system if you keep the gas tank as full as possible at all times.



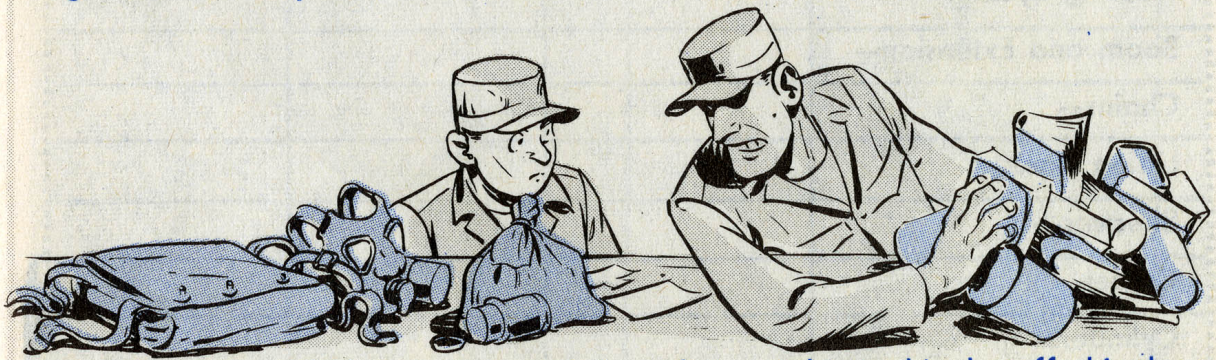
Last, but not least, when the temperature goes below 32° F, use only winter-grade gasoline (FSN 9130-221-0685 for 55 gal) if at all possible.

Carrier—Not Carryall

You may consider your protective mask as so much excess baggage, but it's not such a good idea to treat it that way.

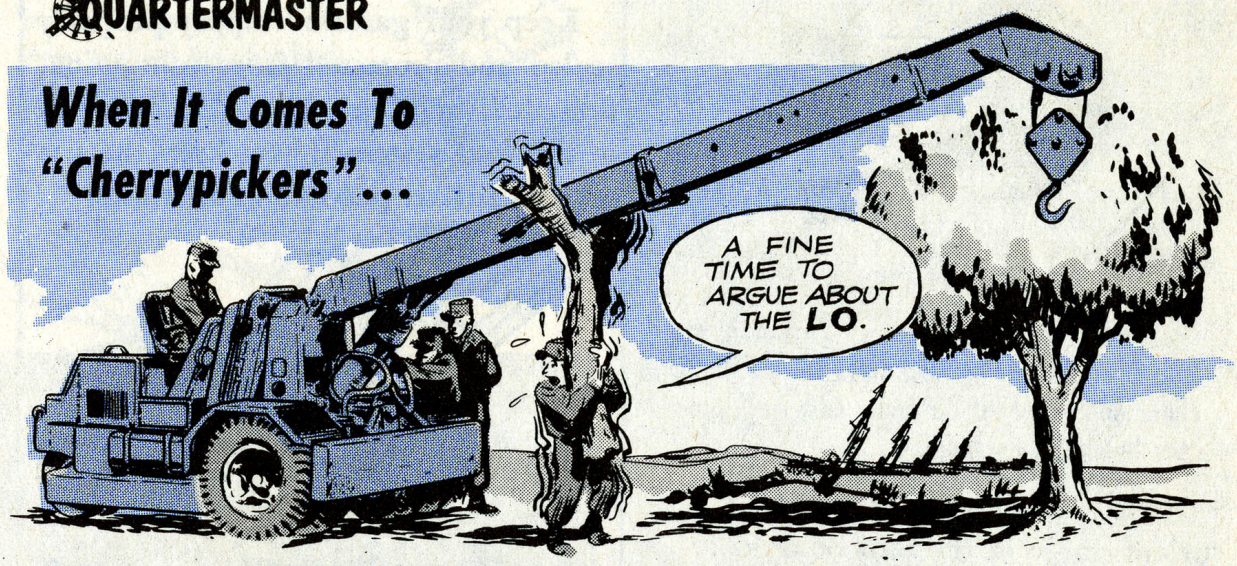
In the first place, it has to be in working condition at all times. That means you should treat it like your life depended upon it. Some time it might.

And you've got a carrier—a carrier for the protective mask and not for rations, books, cigarettes, or what have you. When you load these things on top of your mask you're askin' for trouble. It's these things that are the damage-causers. They can scratch or crack the lens, dent the canister, or leave



particles that would keep your mask from fitting tight. And junk stuffed in the carrier can keep you from getting to your mask in a hurry in an emergency.

Carry only the things authorized to go in the carrier—the anti-dim set, waterproofing bag, protection and treatment set, and the protective mask.



IT'S THE PM THAT COUNTS

What gives hyar?

A guy pulls all his checks... follows the LO to the last drop... and fills out his DD 110 like his life depends on it.

Like most gals, though, that NC 10 Federal Crane (Cherrypicker) still wants more. It wants checks on cable, boom, sheaves, chains, hydraulic hoister and even power steering.

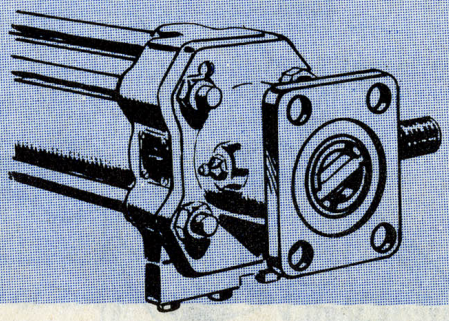
So relax!

There's no sweat, gents, when you make this checklist part of the DD 110. Clip it, glue it or nail it to the "trip ticket." It'll help you make sure that the NC 10 hoists its load anywhere, any time.

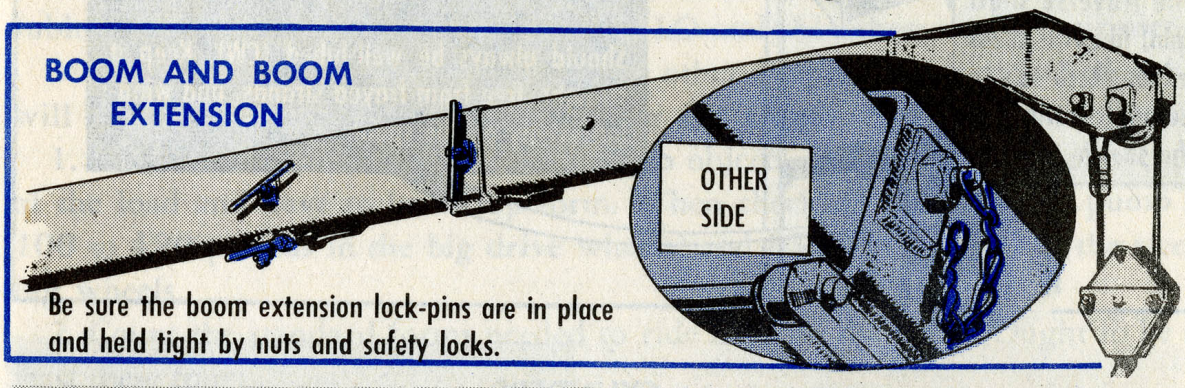
	BEFORE OPERATION	DURING OPERATION	AFTER OPERATION
Steering System—			
Boom and Extension—			
Chains—			
Lifting Hook—			
Sheaves—			
Cables—			
Cylinders—			
Tanks—			
Control Levers—			

STEERING SYSTEM

Test for looseness and be sure the hydraulic booster is feeding muscle to the wheel. Look for hydraulic oil leaks at lines, pump and cylinder.



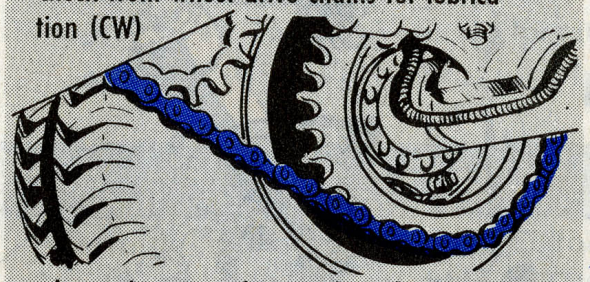
BOOM AND BOOM EXTENSION



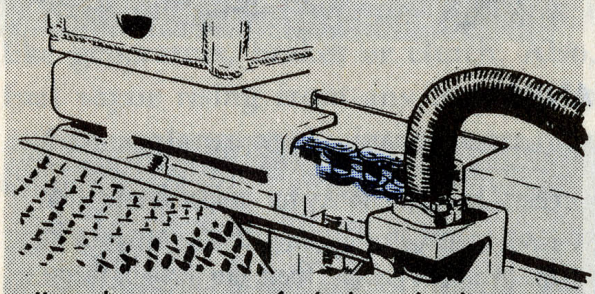
Be sure the boom extension lock-pins are in place and held tight by nuts and safety locks.

CHAINS

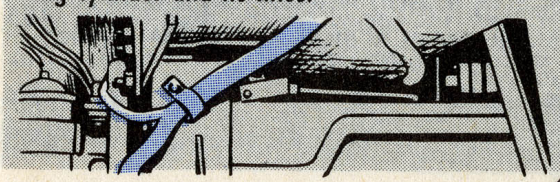
Check front-wheel drive chains for lubrication (CW)



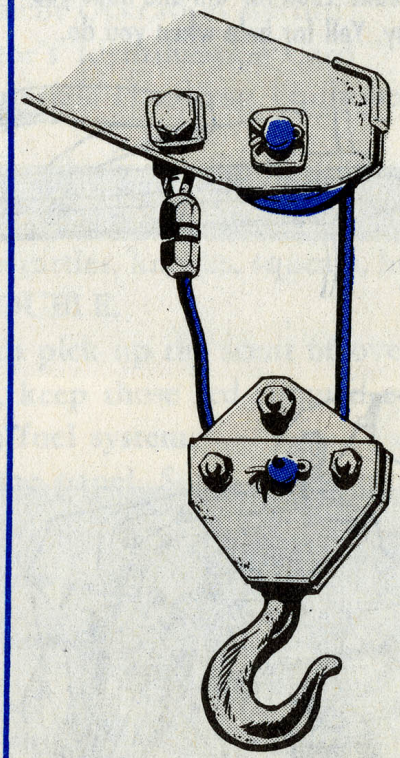
and test the crane slewing chain for looseness.



Keep three eyes open for leaks in the slewing cylinder and its lines.



LIFTING HOOK

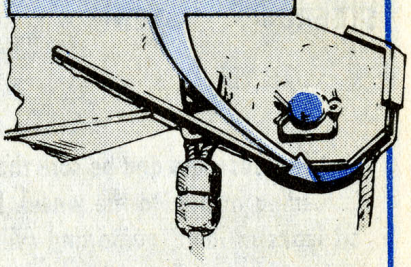


Be sure it's not jammed up into the boom, and its sheave is turning freely.

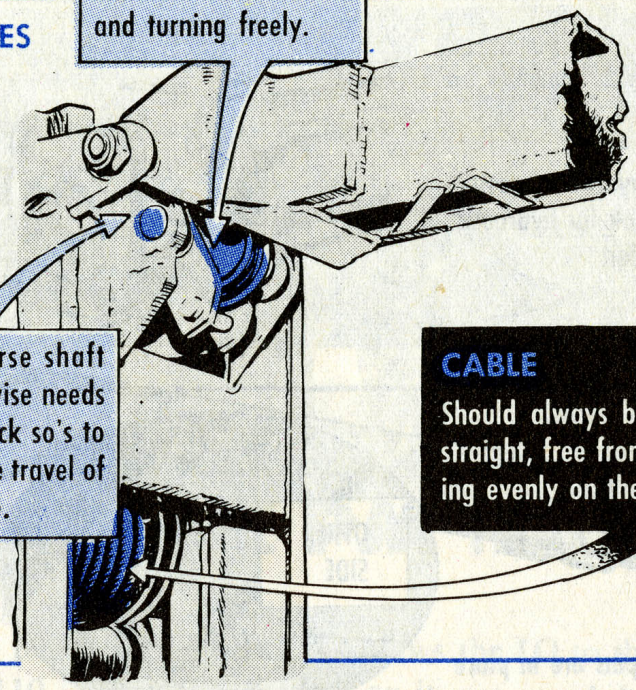
SHEAVES

The load-cable guide-sheave should be clean and turning freely.

Same for the boom-end sheave.



The traverse shaft (pin) likewise needs a lube check so's to permit free travel of the sheave.

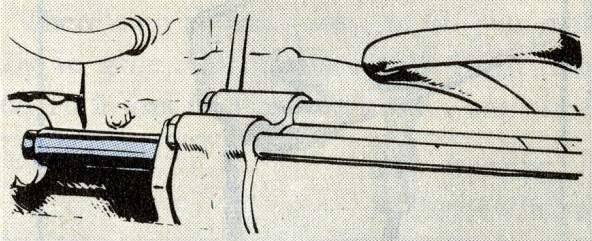


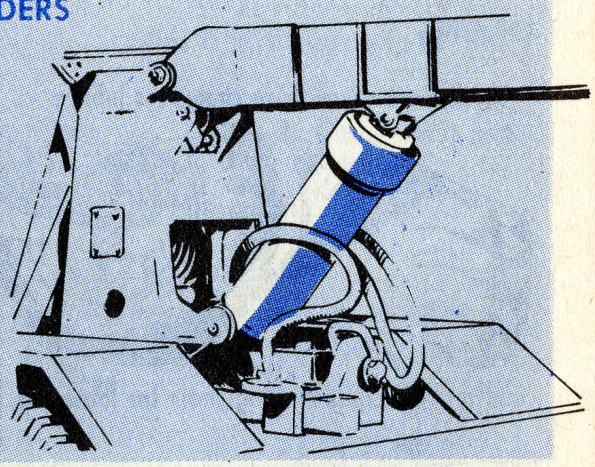
CABLE

Should always be well-lubed (CW). Keep it straight, free from frayed strands, and winding evenly on the spool.

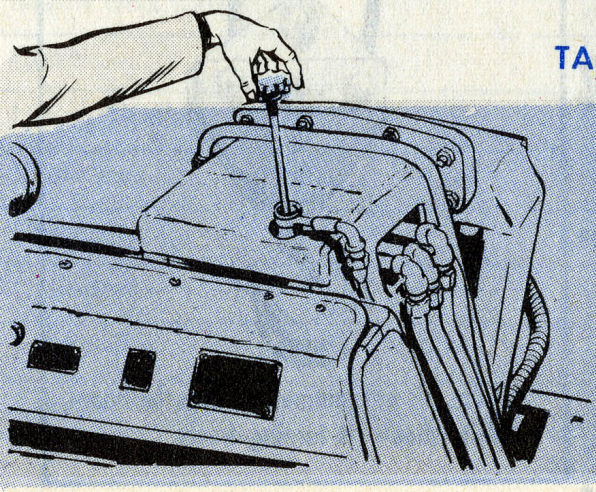
CYLINDERS

Leaks, lads, leaks. Look for 'em and hope you don't find any. Yell for help when you do.

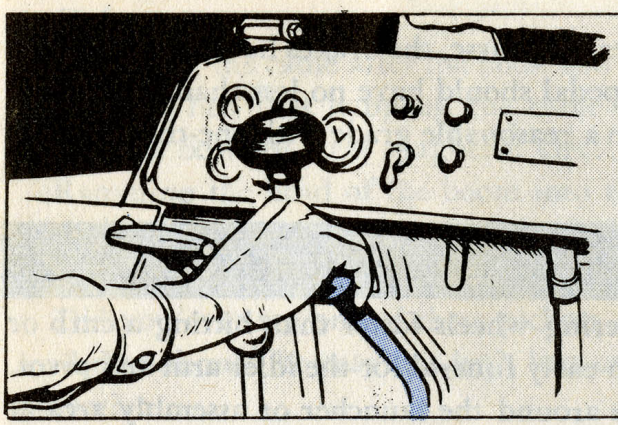




TANKS



Check hydraulic tanks for proper level. Stick your noggin in close and check for leaks in the hydraulic pumps. There are three of them: hoist load, elevating and swing cylinder, and steering booster. Also look at the drive belts on the pumps to make sure they're adjusted correctly.



CONTROL LEVERS

All boom and hoisting control levers should respond easily. Control levers should return to neutral position by themselves.

One rule that's always front-and-center, of course, is: whenever you've got lubing on the brain, keep one eye on the LO and the other on the hour-meter.

Might focus an eyeball on one or two other Before-Operations checks that will make life safer and easier on operator and crane:

1. Look over the tires for wear and sharp objects. They carry the full weight of the load and have to be in top form. When checking tire pressure, pump in **100** to **120** pounds in the big drive wheels; and **85** to **90** pounds in the steering wheels.

2. Count the standard forms needed to ride herd on the crane. Ought to be at least these four:

- ✓ SF 91 "Operators Report of Vehicle Accident"
- ✓ DD 110 "Vehicle and Equipment Operation Record"
- ✓ SF 46 "Motor Vehicle Operator's Identification Card"
- ✓ DA 465 "Work Sheet for Materials Handling Equipment"

During Operations

While the crane is operating, listen for rattles, knocks, squeals, hums and other noises that add up to one thing...TROUBLE.

Keep the schnoz workin' overtime to pick up the scent of overheated parts, like generators, brakes or clutch. Also, keep those red-rimmed eyes peeled for fuel vapor rising from any leak in the fuel system.

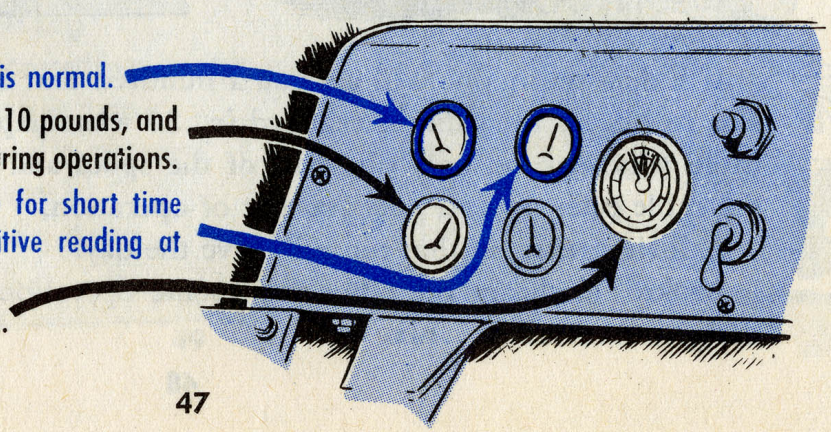
Toss a glance at the instruments on the panel. Some of the top-priority ones to watch are:

TEMPERATURE GAGE—160 degrees is normal.

OIL PRESSURE—Should read at least 10 pounds, and 40 to 55 pounds normal pressure during operations.

AMMETER—A **high** positive charge for short time after starting. Then a **slight** positive reading at idle speed.

HOUR METER—Be sure it's working.



Whenever you're wheeling that lifter, of course, the brakes have to be ready to make with the quick stop. The brake pedal should have no less than ½-in play. The hand brake should hold the load on a reasonable grade with one-third ratchet travel in reserve.

Operation Tips For Savvy Craners

Nothin' shocks the life outta the steering wheels faster than hitting a curb or rail at an angle. Brother, that means an early funeral for the idler arm and pivot.

So next time you're luggin' a missile around the launcher or assembly area at a Nike site (or anything, anywhere) avoid curbs, rails or any other obstacles.

Your picker'll be crankier than a TV star whose last show flopped if you ride around a site that's riddled with gopher holes, ditches, mud flats or sandy soil.

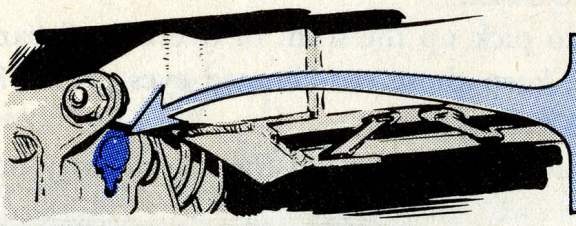
Those two steering wheels tend to give you a bad steer on rough, unimproved ground. If you get stuck, call for a tow. Try to get out under your own power and the oil in the fluid coupling'll overheat and burn out the seals.

So try to keep the NC 10 on paved or well-packed surfaces. Otherwise, steering is going to be mighty rough if not impossible.

MWO 10-1694-A1 (17 July 56) braces the steering stud, but nothin' preserves the gear better than proper use. Speakin' about MWO's, your Cherrypicker should also be sporting MWO 10-1694-A2, which beefs up the winch. Your support shop's lovin' touch is needed to apply these.

When traveling, keep the boom low so's not to tangle with rafters, wires, trees and clothes lines. Lower the boom every time. And when it comes time to go down a ramp or hill, you'll end up staring at the stars if you try to back down. Head down a hill for heads-up operation.

Keep an eye on that hour-meter on the instrument panel. It's the best guide to follow for pulling maintenance services. Since the Picker has no speedometer, the hour-meter is the only guide there is for time and distance.



The red lights really flash when proper PM isn't pulled on the sheave pin on the cable guide. Old man rust just has to be kept away from this little critter.

If it does set in, one will get you a hundred that the sheave can't travel from side to side as the cable is cranked in. So what happens? You guessed it! The cable winds up on only one part of the spool and before you can yell "stop" the cable piles up and puts you out of operation.

A little grease on that pin will save the day.

Lookin' at things the other way, some operations are strictly NG... bad... dangerous... taboo... nix, etc.

F'rinstance:

Unreeling the cable after the hook and block already have touched the ground or load. When that happens, the cable bows out or gets snarled and you end up with a bowl of steel spaghetti. Or...

Ramming the head of the boom into the boom itself. This raises all kinds of hackles on the cable and leads to an early deadline.

Further f'rinstance:

Did you ever see one of these pickers strainin' like an over-age nag to lift a load that **should** be easy but **isn't** because the Joe at the wheel is throttlin' her power?

What happens—and shouldn't—is that the operator tries to use the **boom elevating cylinder** to lift the load to the right height. This happens when the hook is up as high as it'll go, and the load has to go higher still.

Only a Joe with 278 years experience can control the load with the elevating cylinder. And he wouldn't do it anyway, because he knows the strain it puts on the elevating cylinder hydraulic pump. This little critter is belt-driven, and no belt is gonna take that punishment for long.

When the belt gives up the battle, down comes the boom, cradle, baby and all. Kaboom! So keep the boom at a 45-degree angle every time. That gives you enough height and lifting power to lift and swing a missile, beer keg, or what have you.

After Operations

Comes time to shut down for the day, fill out DD 110 including the extra points on the boom, controls, sheaves, etc. Fill up the gas tank—to prevent condensation of moisture. And check with the right people when you find anything wrong during the operation of the crane.

This list of capacities will keep you on the ball when the time arrives to check tanks, reservoirs and systems.

Air Cleaner	**1 pt**
Brake Master Cylinder	**1 pt**
Crankcase	**5 qt**
Differential, drive axle housing	**9 pt**
Fluid coupling reservoir	**13 pt**
Hydraulic tank	**36 gal**
Hydraulic system	**46 gal**
Oil filter	**1 qt**
Steering gear	**1 pt**

Keepin' these on the level is the best kind of PM.

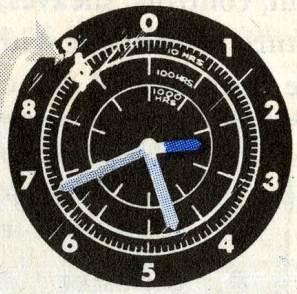
Good maintenance of Engineer equipment calls for doing the job right and doing it at the right time. On most of it, the hour meter tells you the right time for maintenance.

Naturally, if you read an hour meter wrong, you won't be doing PM at the right time. Operation and maintenance records show that goofs were made because somebody read an hour meter wrong—or didn't know how to read it in the first place.

Take an extra look when you record the readings. And be sure everyone in the outfit knows the story about the little hand, the middle-size hand, and the big hand.

Reading an hour meter is easy as telling time on your watch.

That real little hand at the upper left revolves once a minute and tells you two things: the hour meter is working and oil pressure is up. (Oil pressure kicks the hour meter on and off.) So if the real little hand isn't turning when the engine's running, something needs to be fixed.

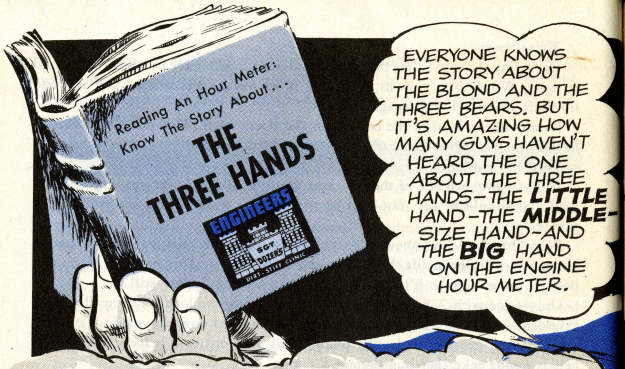


The little hand gives you a 1000-hour reading on the little, inside track.

The middle-size hand is the 100-hour indicator and is read on the middle track.

The big hand shows 10 hours and has the big, outside track.

When you read the 1000 (little) and 100 (middle-size) hands, use the number the hand is on or the number directly behind it. Naturally, if the hands are right smack on No. 2, your reading is 2000 on the little hand and 200 on the middle-size hand. If the hands are between 2 and 3, your reading is still 2000 and 200. Between 3 and 4, your reading is 3000 and 300, etc.



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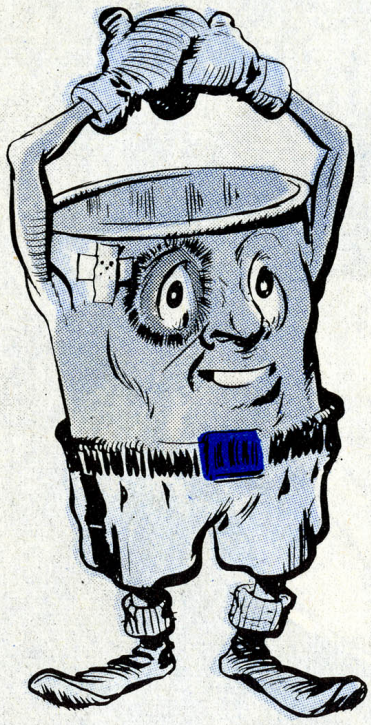
Be sure you have the story of the three hands down pat. And take an extra look on every hour meter reading to double-check.

The little hand is between 2 and 3, so our reading is.....	2,000
The middle-size hand is between 4 and 5, so the reading is.....	400
The big hand is between six and seven, so the reading is.....	60
The tip of the big hand is pointing at the eighth mark past No. 6, so our last reading is.....	8
Bringing all the figures together gives us an hour meter reading of.....	2,468

Be sure you have the story of the three hands down pat. And take an extra look on every hour meter reading to double-check.

THE ONE AND ONLY OIL



Dear Sgt Dozer,

Our LO 5-5398 and TM 5-5398-1 on the Rix compressor say to use Solnos 500, Socony Vacuum DTE 103, or equivalent. I tried requisitioning these oils and couldn't get them. Can you tell me how to get them—or their equivalent?

Sp2 F. G.
Fort Dix, N. J.

Dear Specialist F. G.,

Those Solnos and Socony Vacuum Oils aren't in the supply system. But here's the equivalent. It's the **only** type of oil you should use in the Rix compressor crankcase and force-feed-lubricator.

Lubricating Oil, general purpose		
32° to —10° F (20-weight)	FSN 9150-223-4137	5-gal drum
	FSN 9150-235-5578	55-gal drum
130° to 32° F (30-weight)	FSN 9150-231-6639	5-gal drum
	FSN 9150-231-6641	55-gal drum

Scratch "It's Oil Right"; PS 49, page 42. Things have changed since then.

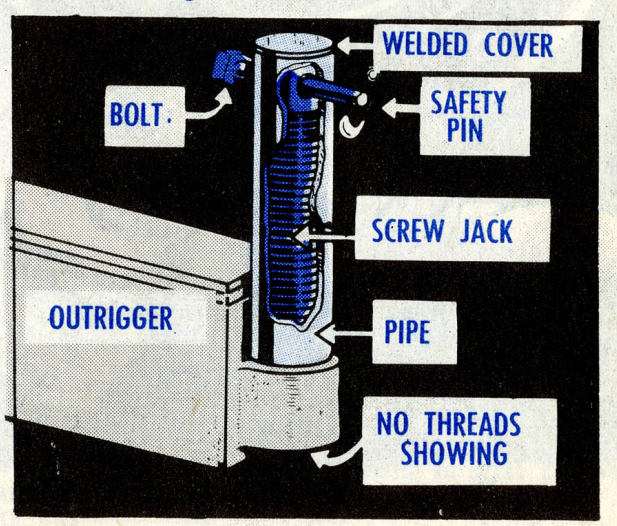
Sgt Dozer

THIS COVER WILL HELP

Dear Sgt Dozer,

Our outfit has the 20-ton Garwood crane-shovel which is equipped with outriggers. When it's not being used the floats are taken off and stowed. Even though the outrigger is retracted, the screw jacks are left without any cover or protection. There's no way of keeping them from working down, either.

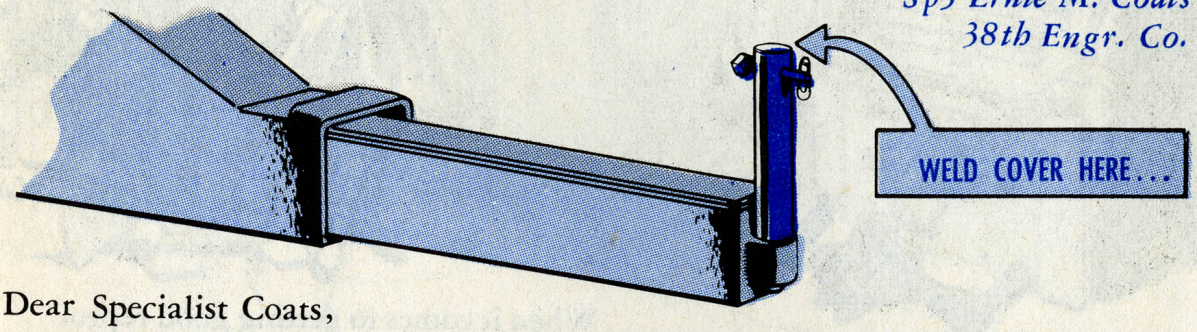
Here's a fix we've dreamed up. We took an old piece of scrap pipe and cut it into lengths so it would cover the threads of the screw jacks when they are screwed all the way up—till there isn't any thread showing at the bottom of the outrigger. Then we welded a cover on the top of the pipe. Next we drilled a hole about ½ inch from the top to take a ¾-in bolt. We also drilled a small hole in the bolt to take a safety pin.



All we have to do is slip the cover over the top of the jack, line up the hole in the cover with the hole in the jack, and push the bolt through. It's kept in place with the safety pin.

This keeps the screw jacks clean and is a big help in keeping them from unscrewing and getting banged-up.

Sp3 Ernie M. Coats
38th Engr. Co.

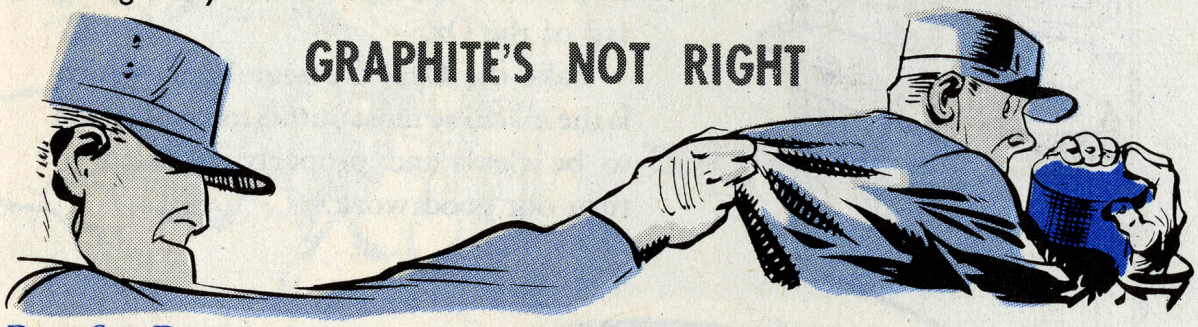


Dear Specialist Coats,

Good fix. You can put it on and take it off in a couple seconds and it'll do the job.

Sgt Dozer

Cleaning rusty crane clutches and drums...



Dear Sgt Dozer,

Is it OK to use graphite to clean crane clutches and drums of rust? I've used it and seen many other crane operators do the same. It really gives the drum a beautiful shining finish, but does it do any harm to the clutch?

Sgt L. J. N., Jr.

Dear Sgt L. J. N.,

Stay away from graphite on crane clutches and drums. As you say, it does give the drum a shiny finish. But graphite is a dry lubricant, and it stays with the clutch and makes it slip, even when the clutch is adjusted right. The ordinary guy will tighten a clutch when it slips. You can see what happens. The tightening and slipping and tightening again routine will get you a beat-up clutch.

So don't use graphite—or any cleaner that has an oil base.

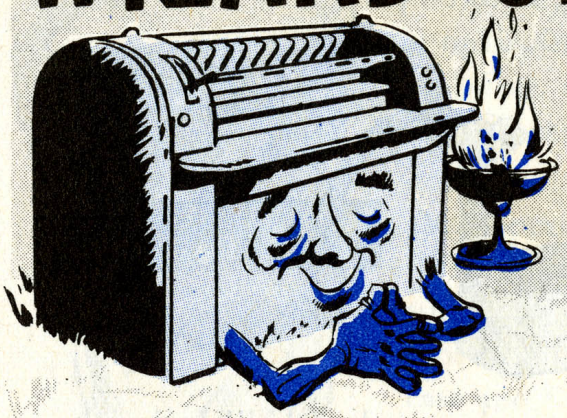
When the rust isn't too bad, loosen it up by running the crane a little. Then blow the rust out with compressed air.

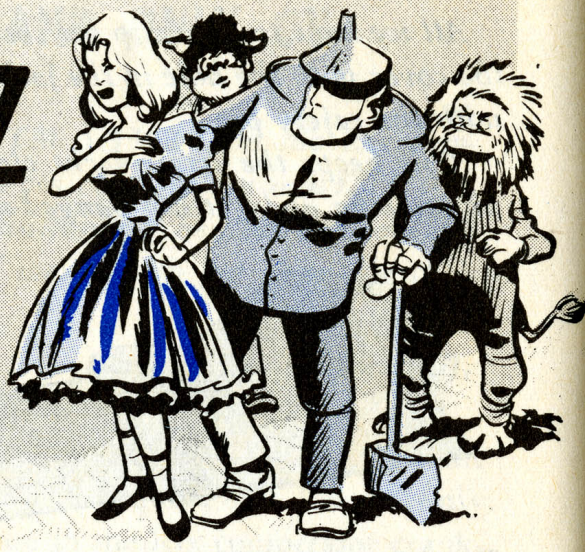
If that doesn't get it all, take the lining out and use a fine emery cloth on it.

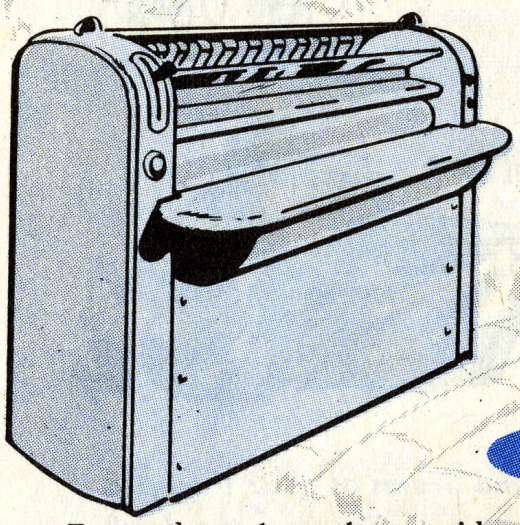
Sgt Dozer

YOU, TOO, CAN BE A...

WIZARD OF OZ



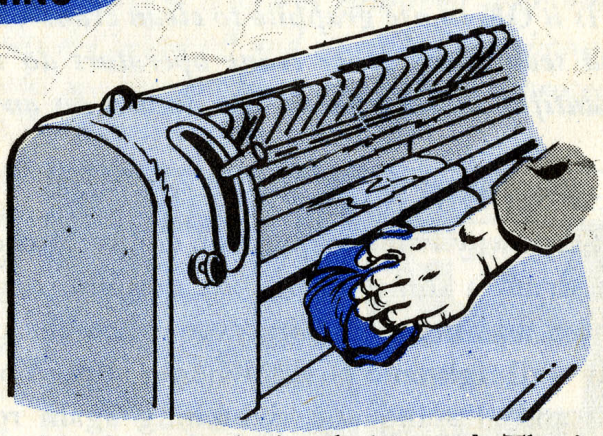




When it comes to getting good reproduction from an ammonia-process machine, there's only one way to do the job right. With a little touch here and some know-how there, you can really be Wizard of the Oz.

Take the Ozalid Streamliner, which is the machine most outfits have. It needs to be clean and properly adjusted to turn out good work.

CLEANING

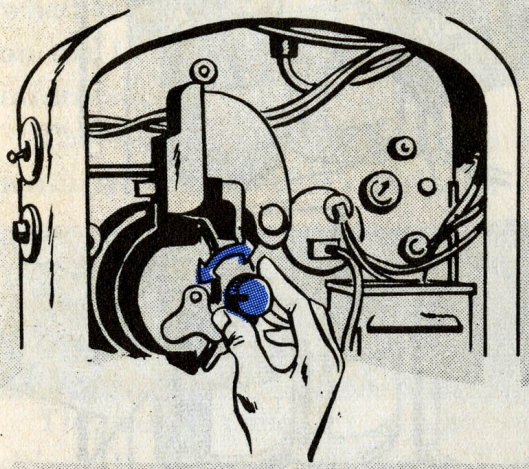


Every day, clean the outside of the printing cylinder. Use any commercial window-cleaning solution that might be handy. Or, to make your own, mix one part ammonia with ten parts water. That cylinder has to sparkle like the orderly room windows.

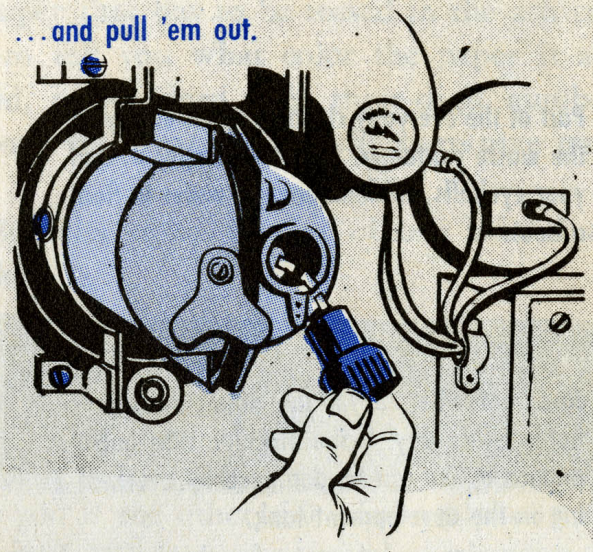
A dirty cylinder doesn't pass the right amount of light from the lamp. Then you gotta make up for lack of exposure with slower printing belt speed. That's no good.

That also goes for the inside of the cylinder. Usually, you clean it once a week. But clean it as often as it gets dirty—every day, if necessary. The lamp-holder-assembly and cooling duct have to come out so you can clean the inside of the cylinder properly. Disassemble her this way:

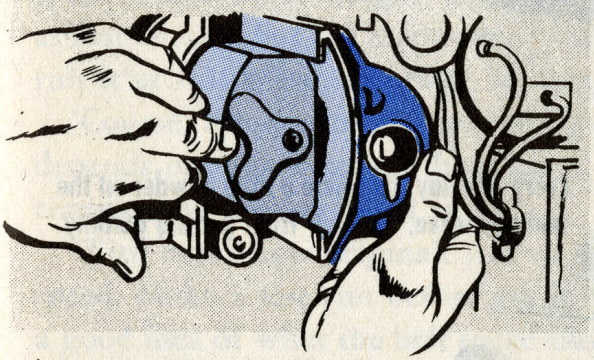
Turn the lamp-holder-assembly knobs (one on each end) a quarter turn either way...



...and pull 'em out.

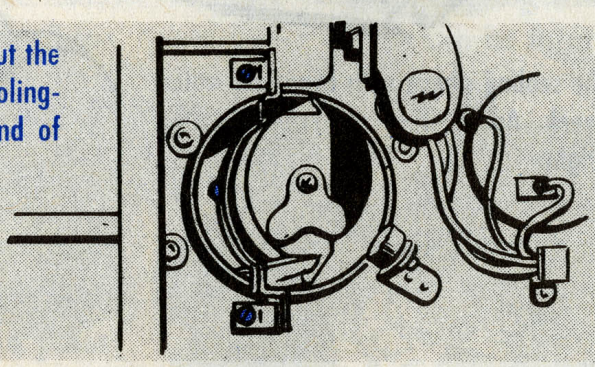


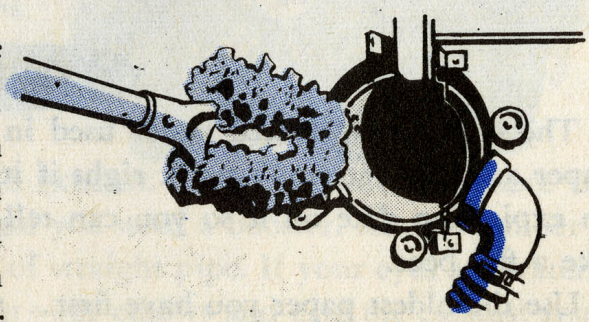
Hold the cooling-duct stop out of the way and pull the lamp-holder-assembly out either side of the machine.



Careful. That lamp costs dough and it's easy to break. And make like a safe-cracker when you handle the lamp. Fingerprints are no good for it.

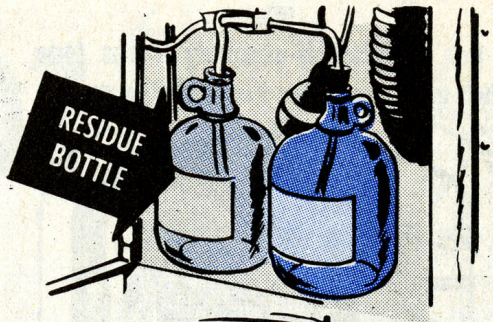
On each end of the cooling duct, take out the three screws that hold the duct to the cooling-duct elbow. Pull the duct out either end of the machine.





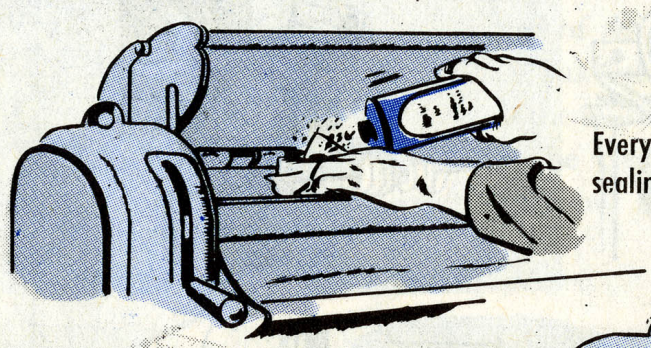
Mix yourself a cleaning solution of one part ammonia to 10 parts water. Wash out the inside of the cylinder with that long-handled swab that comes with the machine. After giving it a good washing, wrap some clean, dry cloth around the swab and wipe the cylinder dry. Also wipe the lamp and reflector with a clean, dry cloth.

Part of the everyday cleaning job is emptying the waste container. Forget to empty it, and your eyeballs will leak enough water to float a boat.



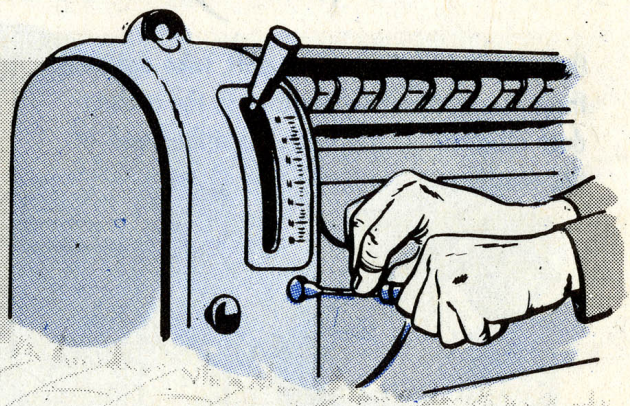
And remember to fill the ammonia supply bottle every day. If the machine runs out of ammonia, she can be damaged by overheating in the development tank.

SEALING SLEEVE



Every few days, sprinkle a little powder on the sealing sleeve. Keeps it from getting gummy.

Wash the sealing sleeve with soap and water every week. Adjust it so it's not too loose or too tight.



PAPER

The chemically treated paper used in the Streamliner is like photographic paper and film—it won't work right if it's too old. Every package of paper has an expiration date on it so you can tell when the chemicals have petered out like a flat beer.

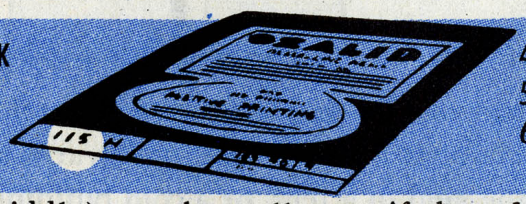
Use the oldest paper you have first... providing it's still good, natch. When new paper comes in, put it on the bottom of the stack. Keep using the newest stuff

first, and you'll wind up with old paper that has to be tossed in the ash can.

Each package of paper is labeled to tell you what color the paper is and whether the speed is extra-rapid, rapid, or standard. The three-digit numbers on the label are coded to tell you about the same thing, only they give more information.

The first number of the three digits tells you the color of one side of the sensitized paper. Here's the color code:

1. BLACK
2. BLUE
3. RED



4. SEPIA
5. YELLOW OR ORANGE
6. GREEN

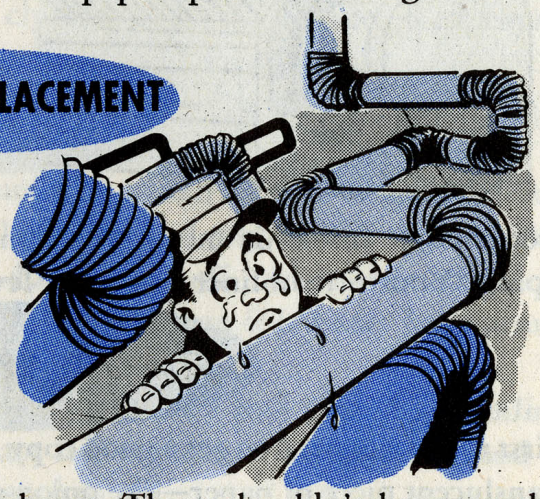
The second (middle) number tells you if the other side of the paper is sensitized. If it is, the first number is repeated. If it isn't, the second number is zero.

The third number gives you a general idea of how fast the belt speed should be. The numbers run from one to 10. (The zero stands for 10, or maximum speed). The other numbers are graduated down, so that five would mean half as fast as zero. For the Streamliner a third digit of zero on the paper means you'd run it at full speed, or about 10 feet per minute.

'Course, those numbers are only a general guide. How fast you run the belts depends on how new and how good your printing lamp is, how translucent or transparent your original is, etc.

With every new original, you've gotta experiment a little to get just the right speed. Make a test run before going into mass production. From it, you can get a good idea of what the belt speed should be. Once you've got it figured out for a certain numbered paper on a machine, other paper speeds can be figured easier and quicker for the same machine.

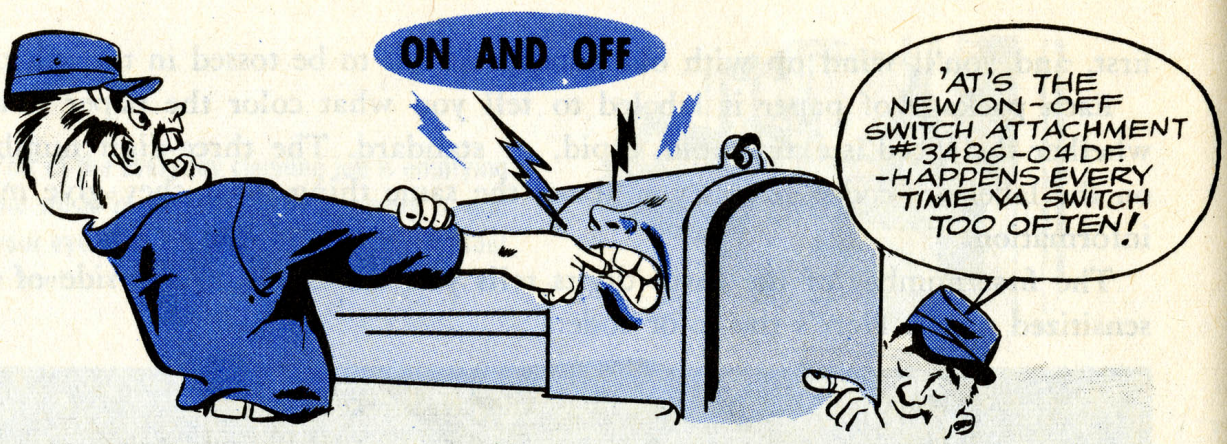
MACHINE PLACEMENT



The 2000-watt printing lamp in the Streamliner works best at normal room temperatures. Too much cold is rough on it. So put your Streamliner in place where it's away from cold walls, out of drafts, etc. Keep her off power supply lines that service heavy machines like welders, grinders, lathes, etc.

Also place her where you have good exhaust. There shouldn't be more than 30 feet of exhaust pipe. Use more, and you need a booster. And remember . . . each elbow in the pipe equals 10 feet of straight pipe. If your eyes are watering like a peeler in an onion factory, count your elbows and give the exhaust system a good check. Also check the sealing sleeve for ammonia leaks.

ON AND OFF



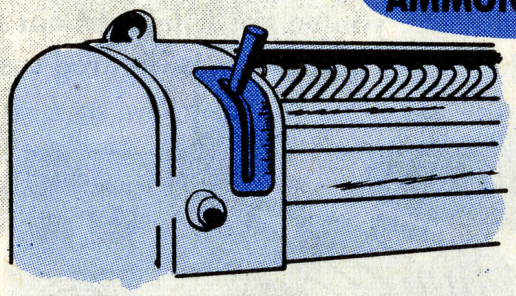
First thing to think about when you flip the machine on is that the printing lamp needs to warm up. At normal room temperature, the warm-up is about 15 minutes. When you're out in the field in a tent, or a cold building, it might take anywhere up to 30 minutes. Wait for the printing lamp to reach full brilliancy before feeding in paper.

That lamp is supposed to last about 1000 hours. The quickest way to wear it out is to turn her on and off and on again often.

If you're using the machine off and on during the day, let her run all day. That's easier on the lamp than turning her off and on several times.

Normal operating temperature for the Streamliner is from 200 to 220°F. Those readings give you the best developing.

AMMONIA FLOW



Normally, you get best performance with an ammonia flow of from 0 to 80 drops per minute. Too much flow cools the heating rod and cut down on developing action...and generally splotches the paper.

Not enough ammonia means you don't have enough fumes for just-right developing. Your Streamliner has to be level for good flow.

FOR GOOD REPRODUCTION

First thing you need to get a good copy from your Streamliner is a good original. A translucent piece of paper—like onion-skin typewriter paper—with clear, heavy lines gives you a good copy.

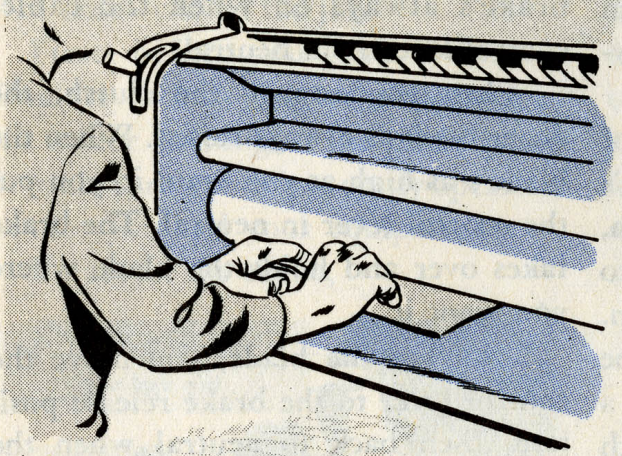
Here's something that'll get better reproduction on typewritten stuff. Ask the orderly room—or whoever's typing it—to put a piece of carbon paper **backwards** on the transparency they want reproduced. That'll give you matched typewriting

on both sides of the paper—frontwards on the typewriter side and backwards on the carbon side. That makes for better developing on the chemically-treated paper, and gives a better reproduction.

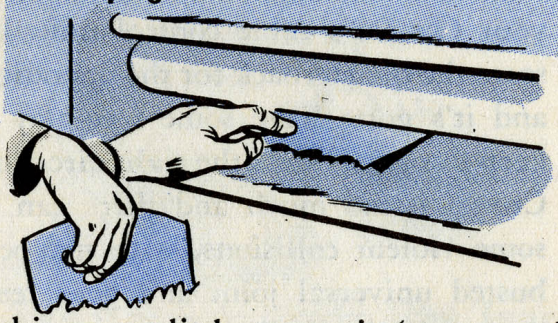
Streamliner reproduction's not like taking pictures or printing them when it comes to developing. With the Streamliner, there is **no such thing as over-developing.** So make sure you're getting full development and don't worry about overdoing it.

Here's an easy test to see if you're getting full development.

1. Run a piece of sensitized paper through the developing stage.



2. Now, tear it in half and run half of it through the developing stage again. If the piece you ran through twice comes out darker —meaning more developed — than the piece you ran through once, you're getting **under-developing.**



That's caused by one or several of these things: too little ammonia (not enough fumes) . . . too much ammonia (cools the tray heater rod and cuts down on fumes) . . . low temperature . . . dirty tray heater rod (rub with sandpaper or steel wool).

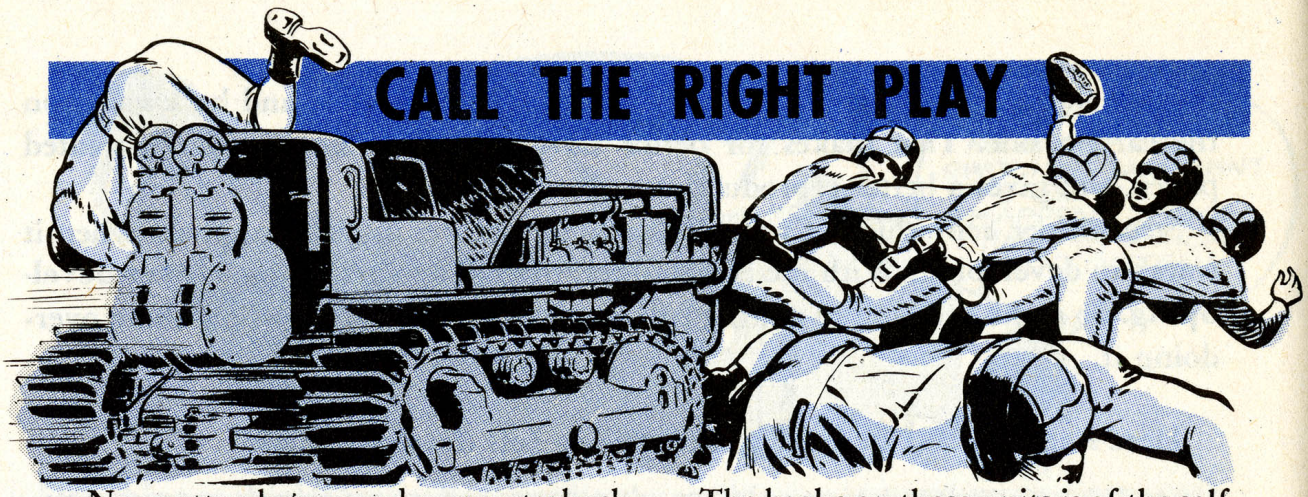
If all those things check out OK, the clyinder's dirty (not enough exposure), or the lamp's shot—or ready to conk out.

SHUTDOWN

Comes time to knock off, turn the shutdown switch around to a full 30 minutes on the dial. That'll let the lamp cool off slow and easy, and shut the machine off automatically. Keep the belts moving during cool-off. Never shut off the ammonia completely any time the machine's running—even if it's only for warm-up or cool-off.

It doesn't take much to turn out good reproductions on your Ozalid Streamliner. Keep her adjusted, keep her clean, operate her right, and she'll do a good job for you.

CALL THE RIGHT PLAY



No matter how good a quarterback is, he's gotta have a little room in the backfield to play around in. And when things get too crowded back there, anything can happen.

Same thing applies to the clutch of your Cat D8's cable control unit. It's sorta the quarterback for the operation, and it's gotta have some free-play to keep things going in the right direction. Crowd it too much and there can be some violent collisions, with maybe a busted universal joint and gear teeth scattered all over the place.

Look what happens when you operate the No. 24 Cat cable-control unit on a D8. You've got about 5,000 pounds of dozer blade going down . . . and a 1,000-RPM engine with better'n 130 horses pulling up.

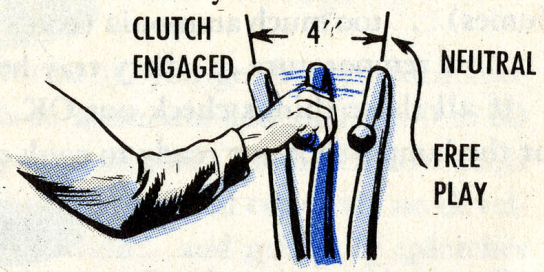
When they meet and there's not enough play in that cable-control-clutch, the sound you'll hear could mean toothless gears and a real gone universal coupling—or a burned-out clutch or a broken cable.

This can happen because the same cable-control-lever operates the brake and the clutch. They're supposed to work as a team . . . but wrong adjustments make them work against each other.

The brake on these units is of the self-energizing type . . . this means the brake's always on when the cable-control-lever is in neutral.

When you engage the clutch, the dozer blade is always raised. When the blade's as high as you want it, you put the control lever in neutral. The brake takes over and holds the blade where you want it.

To lower the blade, you move the control lever to the brake release position, then back to neutral when the blade's where you want it.



With the blade and the clutch being operated by the same control lever, you need **at least four inches** of free movement between the neutral and engaged positions. When you don't have that much play and you put the unit in neutral, you also engage the clutch—at the wrong time. That's when the ruckus starts. The brake and the clutch work against each other.

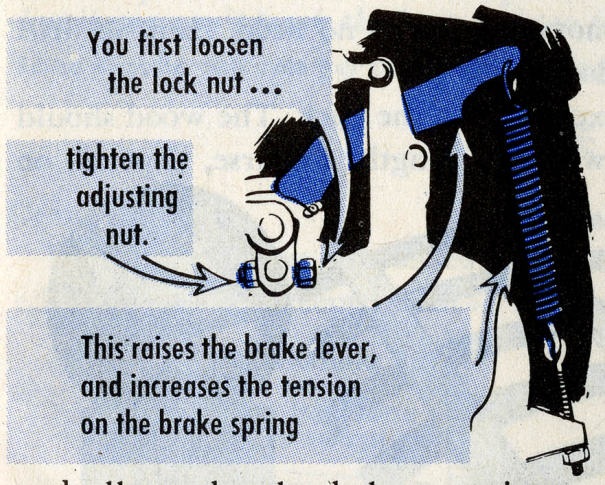
Trouble is that any wear on the brake throws the cable-control-lever outta

whack by cutting down the free play. Then, when you release the cable lever, your rig's gonna take a beating.

Checking the clutch and brake is part of the during-operation preventive maintenance by the operator. He's the guy who can stomp on the trouble before it starts. You can tell by the feel how much play you have in the control lever. If you don't have enough, then the clutch and the brake need adjustment. The operator or the unit mechanic —or both—can do the job.

First—before you grab a wrench: Don't try to make any adjustments with the motor running or the blade raised. It could turn out to be a costly operation . . . for you and your equipment.

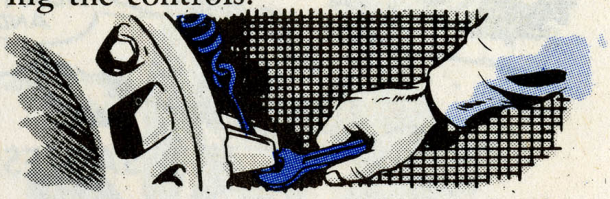
To adjust the brake,



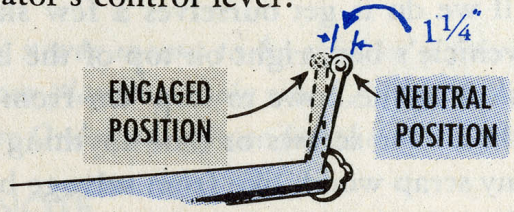
and allows the clutch lever spring to pull the clutch lever to its proper position.

Then you turn the adjusting nut until the "I" or "V" mark on the brake lever is lined up with the edge of the brake lever above the roller. Tighten the lock nut and, as far as the brake's concerned, your job's done.

Now, if the brake doesn't hold after you make the adjustment, tighten the adjusting nut on the brake spring. You turn 'er just tight enough to hold the brake . . . otherwise you'll have to use some extra muscle when you're pushing the controls.



It's no sweat to adjust the clutch. You loosen the clamp bolt and the lock plate, and swing the plate to one side. You turn the drum sleeve until you have 1¼ inches of play between the neutral and engaged positions. This will come to at least four inches at the top of the operator's control lever.



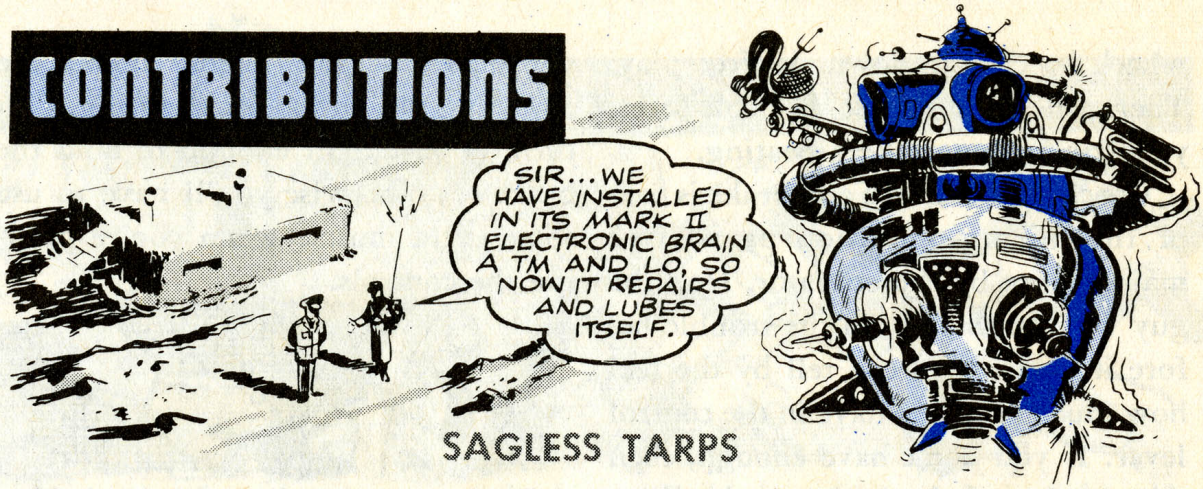
You can have more than four inches of play . . . but you shouldn't have less.

For the No. 24 unit, the direction you turn the drum sleeve depends on the serial number. To tighten the clutch on control units numbered 8D1744 and above . . . you turn the sleeve **counterclockwise.** If it's numbered before 8D1744, then the drum sleeve's gotta be turned **clockwise.**

When you've got that free play just right, all you gotta do is position and tighten the lock plate and clamp bolt. And you're in business again.

This free-play story goes for any cable-control or power-control unit you're operating. Check your adjustment against the TM or operator's manual to make sure it's right.

CONTRIBUTIONS



SAGLESS TARPS

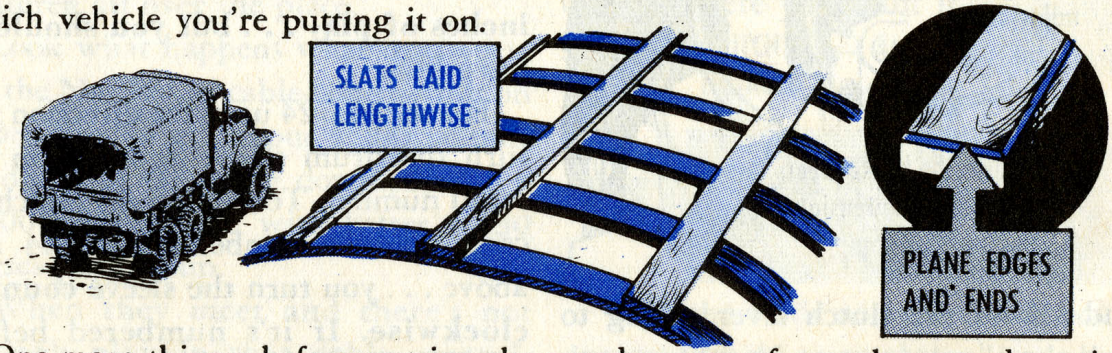
Dear Editor,

You ever notice the way water collects on top of truck and trailer tarps after a rain? You can see why—the tarps have a sag in 'em because the bows are placed wide apart.

We've come up with an idea for keeping rain water from collecting on these tarps by giving the tarps more of a framework. This way, when the tarp is placed over the bows it won't sag, and water won't collect in puddles.

All we do is get ourselves a few slats of lumber and set 'em lengthwise to the vehicle's bed, right on top of the bows—space 'em about a foot apart. Tie the slats to the bows to stop 'em from moving—there's no need, then, to drill any holes for screws or nail anything down.

Any scrap wood, like from salvage boxes, will do the trick. The wood should be about ½ inch thick and 3½ inches wide. Its length, o'course, depends on which vehicle you're putting it on.



One more thing—before putting the wood on top of your bows and putting the tarps over 'em, plane the edges and ends of the wood so the tarps won't be scraping on any rough edges.

What do you think?

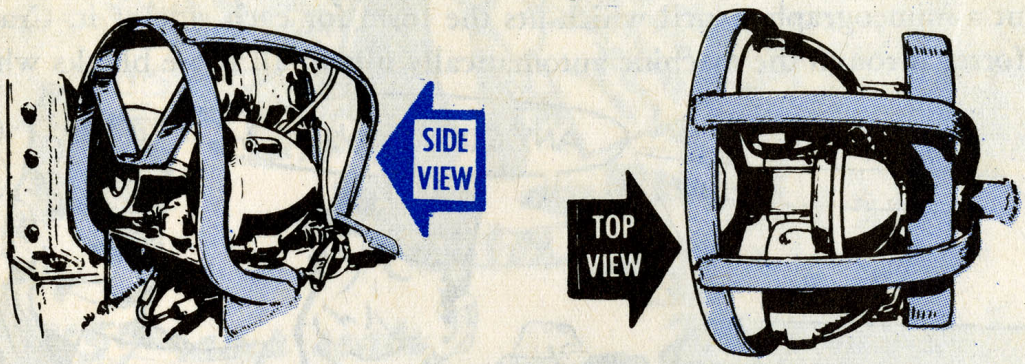
The Gang
Aberdeen Proving Ground, Md.

(Ed Note—Many a wet tarp has been pulled and tied tight because of its sag. Then they'd shrink tight and either split or rip. Your slat method of keeping it sagless will give those tarps a new lease on life.)

HANDY HORN GUARD

Dear Editor,

Here are some pictures of a horn guard we are putting on all our M48 tanks. Too many big feet were kicking the horns off when the crew climbed around the tank. As you can see, this is just a length of ¾ x ¼-in strap iron welded



to the headlight guard and to an attaching plate that bolts to the bracket. Real simple, and we haven't lost a horn since.

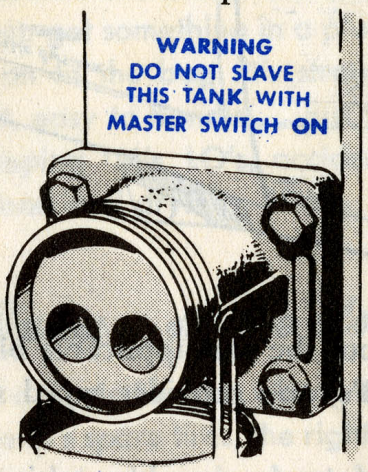
Sp3 Harold S. Farrow
62nd Tank Bn

(Ed Note—Those lights and horns were never meant to be used as a foot-rest, but if you can't teach the boys to keep from planting their size 12's on that spot, then maybe you can get permission of your Ordnance officer for the extra guard.)

SLAVE NOTE

Dear Editor,

Here's a card we are mounting close to the slave receptacle in our tracked vehicles—all except the M42 self-propelled twin 40mm.



We have found that the men occasionally forget the correct slaving procedure and we've had some electrical system failures as a result of attempting to slave a tank with the master switch turned on. Since these cards have been installed we've had no further troubles in that particular respect.

OCMT T. Winter
Camp Drum, New York

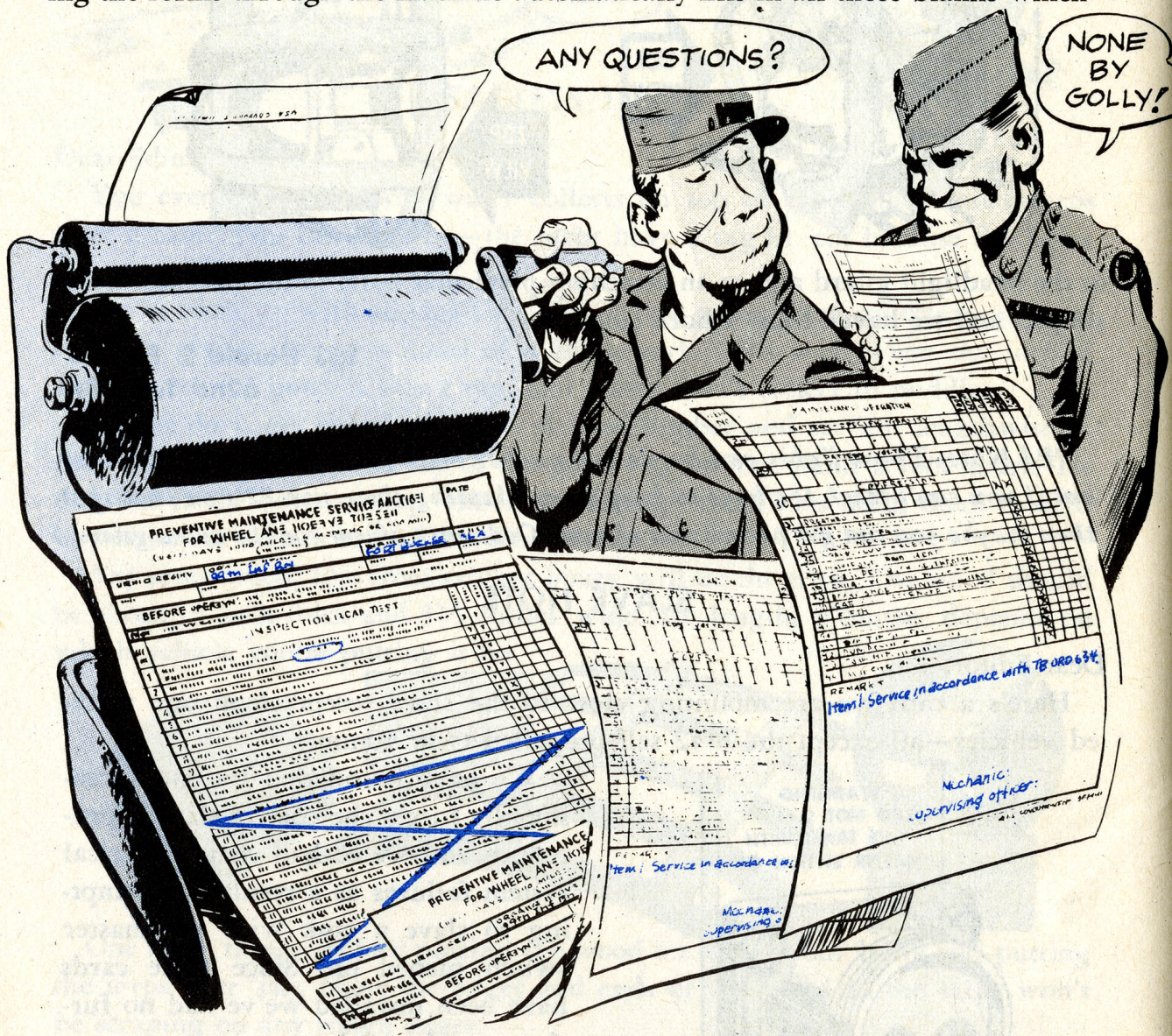
(Ed Note—Sure should help. And on any slaving operation another thing that has to be checked on carefully is to make sure the slave cable wasn't made with its polarity reversed. New ones should always be checked out before they're used for slaving.)

FORM 461 OVERPRINT

Dear Editor,

The 99th Infantry Battalion at Fort Rucker has made use of DA Form 461 real simple.

We cut a mimeograph stencil which fits the form for each side of it. Cranking the forms through the machine automatically fills in all those blanks which

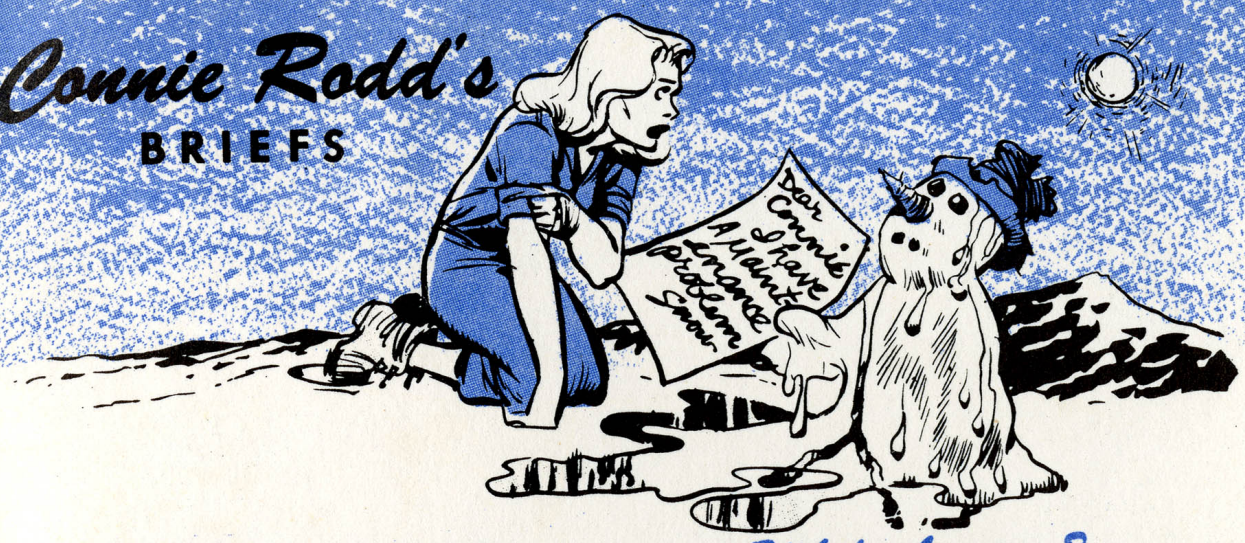


are the same for all wheeled vehicles. It also X's out the non-applicable blanks, adds the necessary instructions about current TB's, and provides typed signature spaces for the mechanic and motor officer.

This is real handy, saves time, and makes for neater forms with nothing forgotten on 'em.

CWO Delbert W. Roberts
Fort Rucker, Alabama

Connie Rodd's BRIEFS



M59 ramp seals

You men maintaining the M59 VAU's can now get the ramp seals when you need a replacement. You'll find them in Ord 7 SNL G280 (Jan 57) under FSN 2510-692-9424 (Ord Stock No. G280-8341855).

Plastic in the rain

Many an operator or driver makes life easier by using plastic bags to protect manuals and other small items. Next time you get something in a plastic bag, hang on to the bag. It's strong, transparent, easy to handle . . . just the thing for keeping TM's, LO's, accident forms, etc. clean and dry.

Valve . . . at 1 o'clock

Just a reminder that when you mount your Jeep's spare tires, the right position for that valve stem is about 1 o'clock, pointing downward. This keeps water and dirt from collecting either in the valve stem or around the inside of the rim where the valve comes through. That's right . . . valve at 1 o'clock.

Who's buying?

Lots of items not available in the supply system are authorized for local purchase. But that doesn't mean the using unit does the buying. Nosiree-bob! The right way to get these items is by asking your support unit to do your shopping. DA Pam 310-1 (Index of Administrative Publications) lists each tech service's procurement regulations in the SR715-series.

Can it

Put a No. 10 can over the exhaust stacks on your M52 self-propelled howitzer when you're washing it, and you'll keep water out of the engine and manifolding systems. You can get a can like that from the kitchen any time.

Marker light mixup

Ever draw the blackout marker light FSN 6220-776-2614 for your Jeeps and then cuss up a storm because you got the big light for the 2½-ton's? Try FSN 6220-772-3899 (G-244). Believe it or not, that's the little one.

DID YOU
*DEGSBWOOAVES?
*DISCONNECT BATTERY GROUND STRAPS BEFORE
WORKING ON OR AROUND VEHICLE ELECTRICAL SYSTEMS